VOL. 1 NO 4

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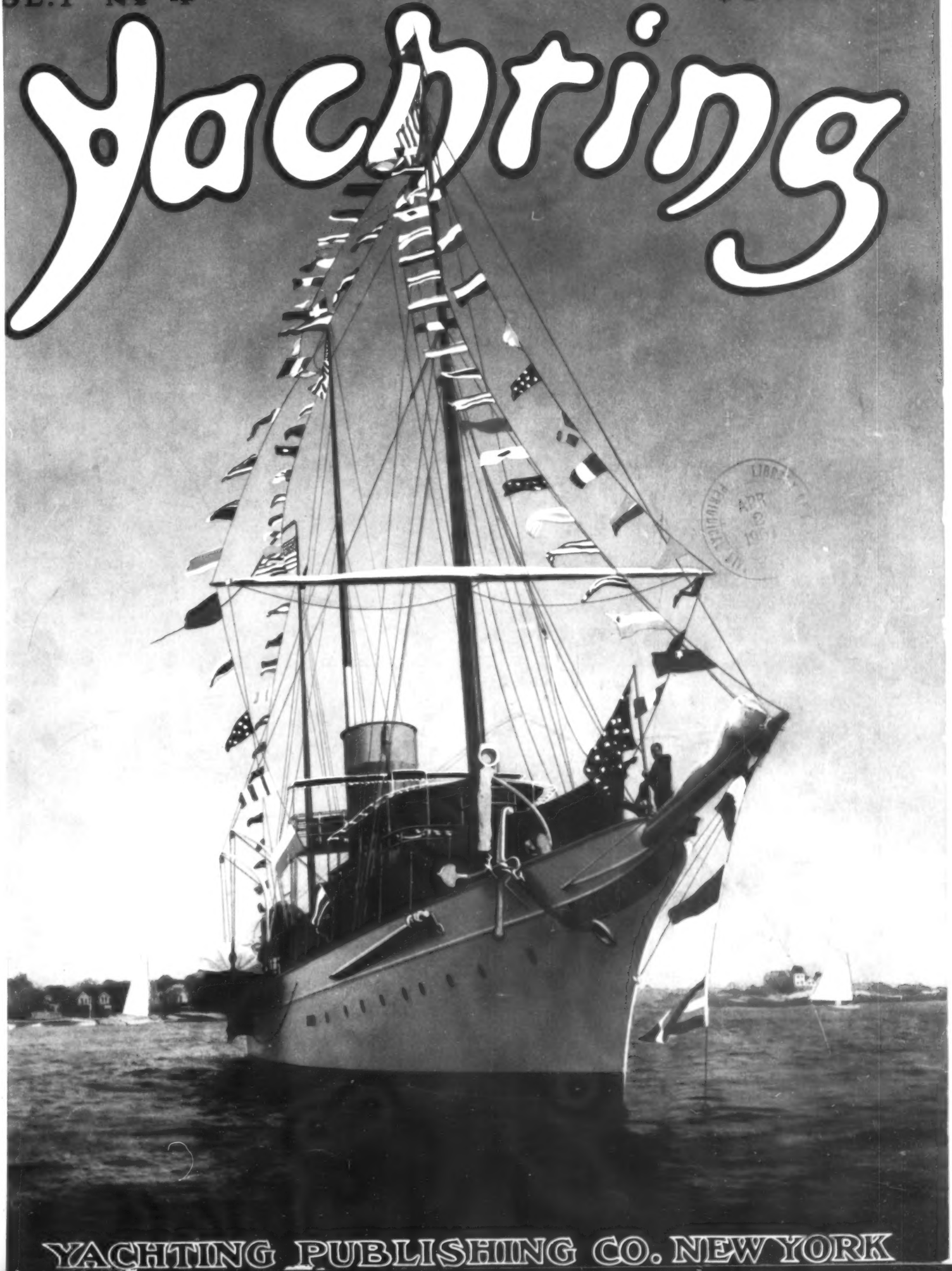
Yachting



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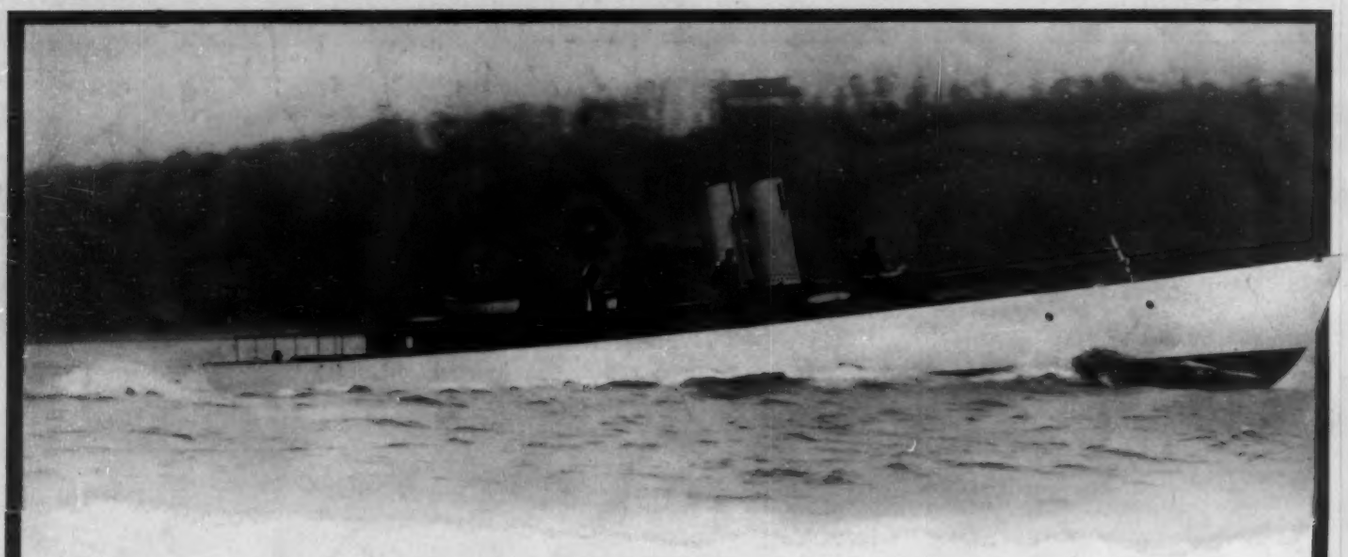

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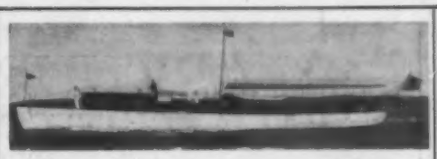

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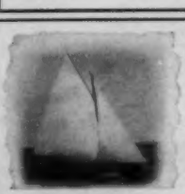

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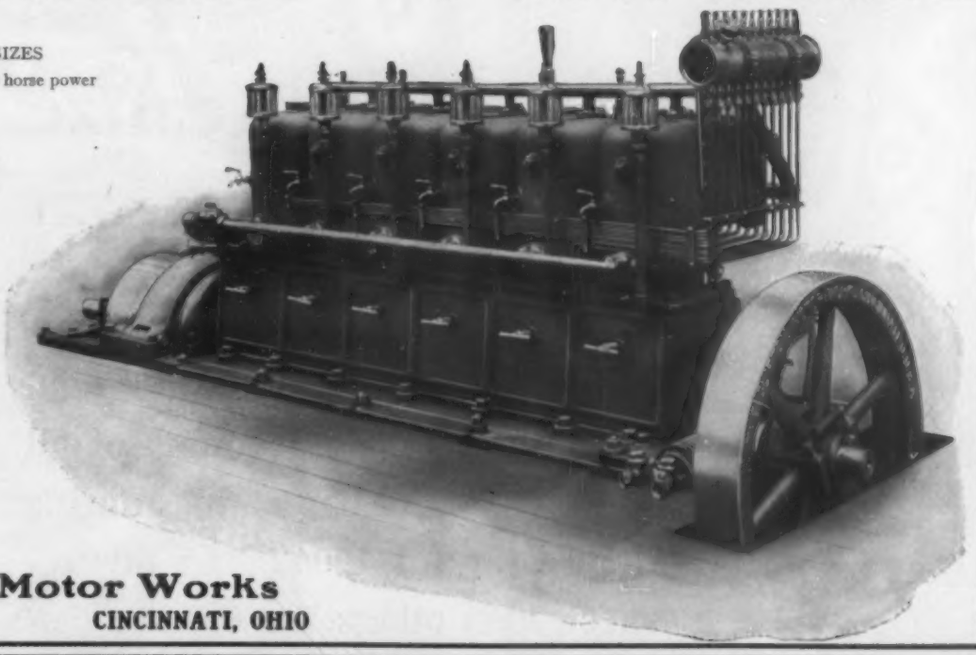

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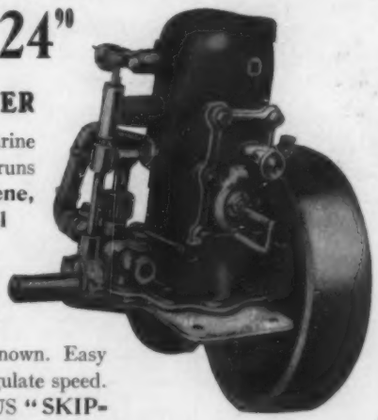

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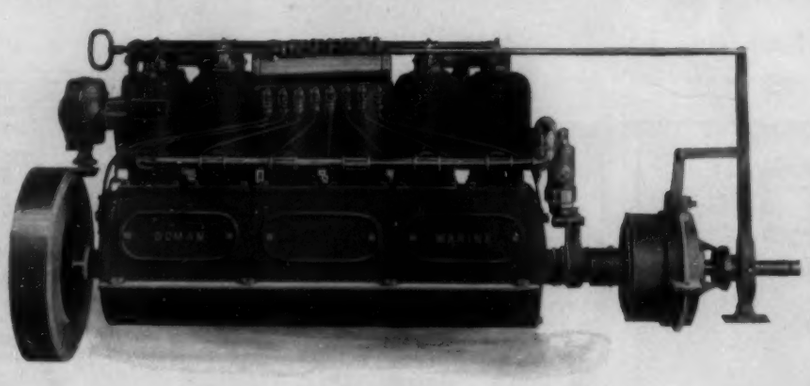

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The sailing regulations and racing rules, as called here, are similar to the ones of a yacht club, with slight variations, the most important being the time allowance, which is entirely different from those of the water boats. Ice boats are divided into four classes. Those of the first class, with a spread of runner plank of 20 feet and over and a sail area of 1000 square feet and over; second class, over 15 feet and under 20 feet spread, and 700 square feet of sails; third class, over 10 feet and under 15 feet, with an area of 350 square feet; fourth class, under 10 feet spread and 200

IMP—A CRACK SHREWSBURY BOAT.

square feet of sails. A good general average for an ordinary boat, unless built for racing, is 20 square feet of canvas to 1 foot of runner spread.

Some of the noted racers that won laurels in different races last year are: Haze and Rocket, first class boats; Drub, Georgie, Atlanta, third class, all of the North Shrewsbury Club; Sweetheart, Shrewsbury, Harold, Florence, third class, of the Shrewsbury Club; and the Hazel L., Leroy-Mildred, X L N C, third class, also Rumson, Iota, Foxey, fourth class boats, of the South Shrewsbury Club.

Most boats use lateen-rigged sails, always trimmed in close, whether going with the wind or against it. Sailing season opens with the first ice strong enough to support the boats, beginning often at New Year and lasting into February and March.

By the end of January, sometimes earlier, to the end of February, the ice is generally in condition, hard enough and suited for racing. Racing days are quite an event. Everybody, even if not directly interested, enters with animation into the spirit of the sport. The banks of the river, giving a good view of the assembled boats ready for the start, are crowded with spectators, bets are made, points of each boat discussed, amateurs, club members and boat owners act alike; the all-interesting topic is the coming start, anticipation mingles with expectation, the usual excitement before a race is in evidence.

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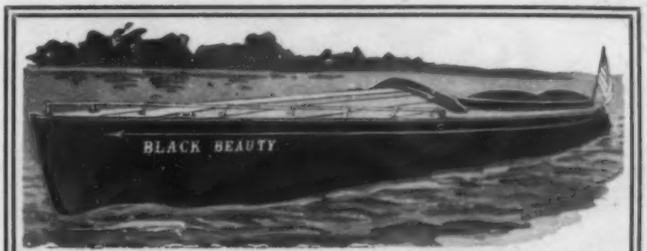

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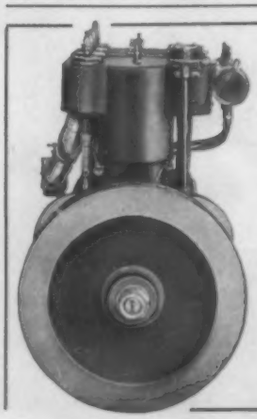

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Against the crystal white ground of the hard ice of the course the dark boats, crews and starters stand out sharply defined against the horizon, a sight worth seeing, especially so if bright sunshine and a blue sky add to the picturesqueness of the scene.

Now the first gun speaks. All is excitement and bustle; the boats are pushed in line; they are prepared to start now. One minute later and the second gun sends the racers flying down the course. A good start means much. By catching the force of the wind and sailing before it, the navigator, as well as the hand at the "tiller," show their skill. After once started, no change in crew, taking on or disposing of ballast or alteration of any kind is permitted. The course is generally 15 miles. The finish is between the stakes, and, as the first boat is passing the imaginary line for the last time, the gun booms again, this time heralding victory for the lucky owner of the winning boat.

This season there has been much good racing, Drub, X L N C, Hazel L. and Red Rover showing up exceedingly well in the South Shrewsbury, and on the North River there has also been a season of splendid sport. One of the best races this year

A CLOSE START ON THE NORTH SHREWSBURY.

was won, on a 10-mile course, by a new boat, The Imp, of the North Shrewsbury Club, Messrs. Burd and Willis, owners. The following boats started: Silver Heels, Daisy, Tyro, The Imp. The Imp's time was 27 minutes 51 seconds. In the next race The Imp defeated the same boats on the regular 15-mile course. Time, 48 minutes, 29 seconds.

IN the February number of YACHTING, it was stated that the 60-foot sloop Neola had been chartered to Mr. J. A. Blair, Jr., for the season. Mr. Blair really has purchased the yacht outright from her owner, Mr. J. Berre King, and will race her throughout the coming season.

In the March number of YACHTING we inadvertantly neglected to state that Mr. Norman L. Skene designed Ariadne, the 32-foot power boat, of which we printed plans.

The photograph of the famous schooner yacht America, which appeared as a frontispiece in the March YACHTING, was taken by N. L. Stebbins, of Boston, in 1882. It was the first picture ever taken of this boat under sail.

Motor boat owners are planning a race for next summer for power boats between Chicago and Cleveland—the longest power boat race on record. It was suggested at first that a big event, something of a Glidden tour of the Great Lakes, from Chicago to Toronto, should be undertaken, but this was not regarded practical at present, and the distance was cut to Cleveland. If this is carried out the race will be over 200 miles longer than the one of last season to Mackinac Island.

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A THIN, COLORLESS LIQUID

Waterproofs Canvas

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BECAUSE EVERY FIBER IS MADE **DAMP PROOF**

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VESSEL OWNERS AND MANUFACTURERS OF BEST QUALITY OF
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DEAR SIR:— ST. CLAIR, MICH., August 14, 1906.

The canvas cover for Steamer "Maud," which was treated with "PRESERVO" three years ago, is as perfect now as the day it was put on. The cover was 40 feet wide and 50 feet long, made of common 10-ounce single filled duck. It has been rolled up and stored away, often right after being out in the rain for days, without any injury at all. The water does not even make it damp and the ice will not stick to it in winter. The waxy nature of PRESERVO prevents friction and the canvas does not wear out like other covers. Light covers are as good as heavy and easier to handle. Any piece of canvas, no matter how poor, treated with PRESERVO, answers the purpose. Yours truly,

BELKNAP & PHILLIPS.

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DEAR SIR:—Please ship to our store, care of C. G. Lampman, at Sault Ste. Marie, six hundred five-gallon cans of brown "PRESERVO" for our hatch covers, and two hundred five-gallon cans of white for our awnings.

"PRESERVO" has given thorough satisfaction. The under side of the covers is never even damp and in the severe cold weather the ice does not stiffen them and they can be folded up as easily as in warm weather.

Yours truly,

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Corduroy collars, hand-sewed ivory buttons, and our **FISH BRAND** woven into the silk label, gives them snap and character.

The long coats for ladies, so popular last season, will embody all these new features.

Our line for men comprises long coats, jackets, pants, and silk-lined soft hats. Pants are furnished with belt straps.

Men's Yachting Coats, long	$4.00
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Ladies' Yachting Long Coats,	4.00
Automobile Frocks,	6.00
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If your outfitter does not sell them, have him get them, or send order and price to us, and we will see that your wants are attended to.

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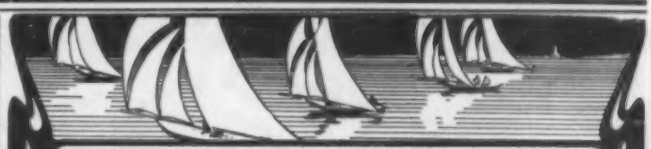

Yachting Uniforms

¶ This will be the busiest season on record in our line. The rush has already begun.

Get our Catalogue Y and make up your order before the season is too far advanced.

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OUR motto: NOT HOW CHEAP? but HOW GOOD? can we build our boats. Not for ONE year, but for many years' service, returning manifold value to the owner, and giving him the gratification of a distinctive craft. We have been building pleasure boats as a specialty for the past fourteen years, our trade constantly increasing, and we hope to continue for at least fourteen years to come. The demand for Matthews' Quality from those who know and appreciate good boats, has made necessary the largest and finest plant in the country, which we have just erected and put in operation at Port Clinton.

Our construction is advanced and individual, with undeniable advantages over the old routine methods. The catalogue explains HOW. Send for it, with 10c. postage. Don't try to save a trifle on first cost, but pay a little more and get SAFETY and SATISFACTION rather than disappointment. Matthews' boats have "tone" with their quality. They are the "smart" kind.

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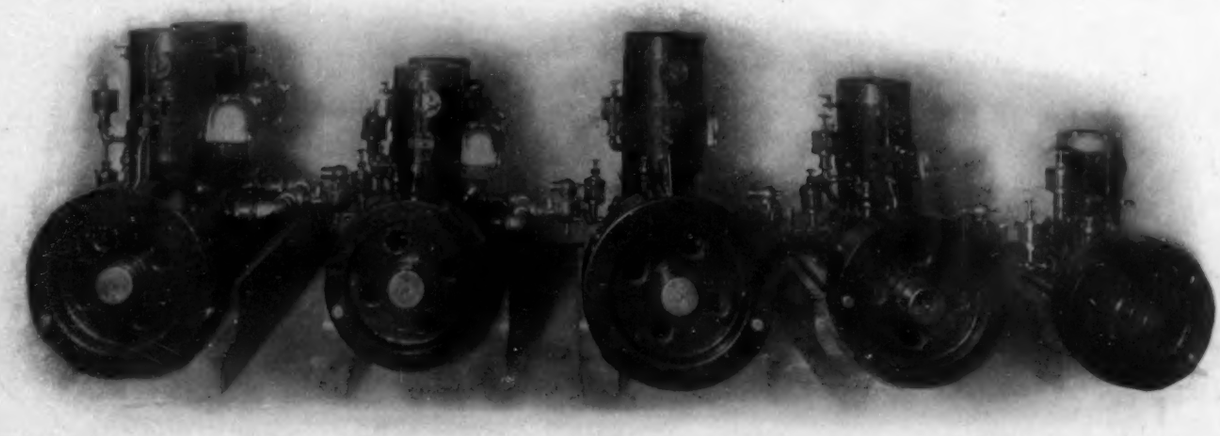

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IS durable, saves space in the boat, and has few and simple parts. It is the perfect engine for the small or large power boat. It is built on the interchangeable plan and presents the highest development of marine engines. Its speed regulation is the best. It is easy to start and easy to stop. Each engine is fitted with a high grade carburetor having slow-down attachments, automatic oil cups, two grease cups, two plain mufflers, shaft coupling, ball thrust bearing, can of oil and grease, and full directions for setting up and operating. Send for Catalogue B. B.

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In the Captain's Cabin

THE April issue of YACHTING is submitted to the public with confidence born of standards attained in foregoing numbers of this magazine. As we have often pointed out, a publication devoted to the sport of yachting in its various branches has, if full scope of possibilities are to be realized, a plenitude of problems to meet and solve such as fall to the lot of few periodicals. There is the element of beauty, an essential element; there is the technical viewpoint, demanding no uncertain treatment; the apportionment of relative values in regard to the various ramifications of the sport, and the application of human interest.

The proper collocation and balancing of these requirements postulates a magazine not undivorced from success, and YACHTING, from the fact of its enthusiastic reception by yachtsmen throughout the country, finds warrant for the belief that in large measure requisite conditions have been approximated. As we have gone on from month to month our touch has become surer, and as praise has strengthened us in the furtherance of some of our ideals, so criticism, always kindly and generally wise, from our point of view, has aided us in the elimination of mistakes and the correction of shortcomings.

The April YACHTING represents the cumulative experience derived from the production of previous numbers, in short. We feel, we know, that at last we are not navigating uncharted waters, nor sailing past unlighted headlands. The buoys are all out now, dead reckoning is a thing of the past—with eyes on charts, with every landfall noted, YACHTING will go on confidently, a safe craft, a beautiful craft, an interesting craft, and a craft well manned.

In the line of constructive magazine work we cannot do more than call attention to the article in another part of this number on the amateur as a practical navigator. Written by Mr. Frank S. Hastings, than whom there is no more skilful amateur afloat, the matter cannot be other than instructive and interesting, while at the same time it marks an enlargement of scope in this magazine which shall not be suffered to wane. The article, too, on record-breaking steam yachts should make its appeal, while the pages devoted to the dory will, we dare say, find justification in the minds of everyone who loves a small boat.

Nor have seasonable opportunities been neglected. Every amateur not over supplied with means will value the instruction contained in the article on the best methods to be followed in putting a yacht in commission, from the stripping of the winter coverings to getting the craft into the water. With every detail covered, the pages of the magazine devoted to this subject will quickly suggest preservation for reference in future years. The motor boat interests have adequate representation, and in this respect it might be said that no deviation will be permitted in future numbers. Some of our readers have suggested that in past numbers perhaps too scant attention was paid to this delightful class of boats, and we are inclined to agree with them. It is but right, however, to say that this was only because we were feeling our way in this regard, striving for effects, stories, and photographs new and unhackneyed. Now that we know our ground, we are prepared to say that this charge may never again be brought against us, but at the same time the "wind-jammers" need not fear any relaxation of regard and attention to their interests.

Especial attention is commended to the story of the Edna, by Mr. Hains. With the storm described in this number the dark cloud which finally envelopes that brave little sloop begins to rise, and from now on the story runs on with a thrill in every instalment to the grim climax with which the serial is concluded.

YACHTING'S COVER DESIGNS.

Frequent comment has been made on the covers of YACHTING, and inquiry is often made about the mode of reproduction. It will interest those who are not familiar with the mechanical end of a magazine that the covers we are running are from actual photographs without the medium of the artist's brush other than to color the photographs. In making a cover the photograph is enlarged, then put into the hands of an artist who colors it correctly, giving each minute portion its proper color value. Plates are then made in the colors necessary for reproduction. We have arranged for YACHTING one of the most striking series of covers that have ever appeared on any periodical.

COMMENT FROM SUBSCRIBERS.

We are receiving many letters of encouragement and congratulation from our friends the readers of YACHTING, which give us a great deal of pleasure, and for which we wish to extend our hearty thanks. We cannot refrain from reproducing one of these we recently received from a yachtsman of considerable prominence in Detroit:

"I am in receipt of your first two copies as acknowledgment of my six months' subscription. I wish to extend congratulations and my heartfelt thanks for a yachting magazine worth reading.

"I have discontinued the others, which I had been purchasing, single copy, of a news dealer, for lack of something better; but skidoo the lemons. Enter a book that covers the ground more thoroughly and in a more enjoyable manner than all the rest put together, and you have YACHTING.

"At last the amateur has an opportunity to read something more than professional news and get an idea of what's doing without going through a mass of dry technicalities of which he knows nothing.

"Your monthly is certainly a winner and I cannot say too many good words for it."

If this letter expresses the sentiment of the majority of our readers, we shall consider that we are in the right channel.

ABOUT SELLING BOATS.

Just as we go to press we receive a letter from one of our subscribers, Mr. G. G. Bell, as follows:

"I take pleasure in informing you that I have sold my yacht Marguerite through an advertisement in your March issue. Naturally, I am pleased and wish to congratulate you on the result obtained; it has certainly been quick and to the point, and goes to show that YACHTING is a valuable advertising medium."

This letter was written only a little more than a week after the publication of our March number, in which Mr. Bell's advertisement appeared, and shows how immediate was the interest shown. It is very gratifying to know that our For Sale Department is producing such quick results. In reaching the best yachtsmen in the country, YACHTING brings the boat advertiser in touch with men who buy and do not quibble over the price.

If your boat is for sale and you have neglected to advertise it, why not do so in the May issue of YACHTING, which will be published April 30? The special rate is $1.75 per inch, which includes the making of half-tone cuts without extra charge from photo. of your boat furnished.

Elco MOTOR BOATS

ELCO EXPRESS.
10 Meter Class.
Speed 20 Miles.

60 Foot Motor Yacht
"REVONAH."
50 H. P. Speed 13 Miles.

25 Foot Electric—65 Miles on One Charge.
THE IDEAL LAUNCH.

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Gasoline Motor Boats. We use high grade engines built by manufacturers who give their attention entirely to marine engines. With our unexcelled factory facilities for building boats of the very highest construction, and with our 15 years' experience, we are enabled, under this plan, to furnish the most complete up-to-date motor boat obtainable in the market, fully guaranteed.

Electric Launches—We are the only builders, equipping them with our own electric apparatus. They are recognized as The Ideal Launch for use on mountain lakes and rivers, and with our new light weight battery are equipped to run 50 to 100 miles on one charge.

Our Illustrated Catalogue sent on receipt of four cents for postage.

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N. Y., on C. R. R. of N. J.

Two 100 H. P. Gasoline Engines. 93 Foot Twin Screw Motor Yacht "DIXIE." Speed 15 Miles.

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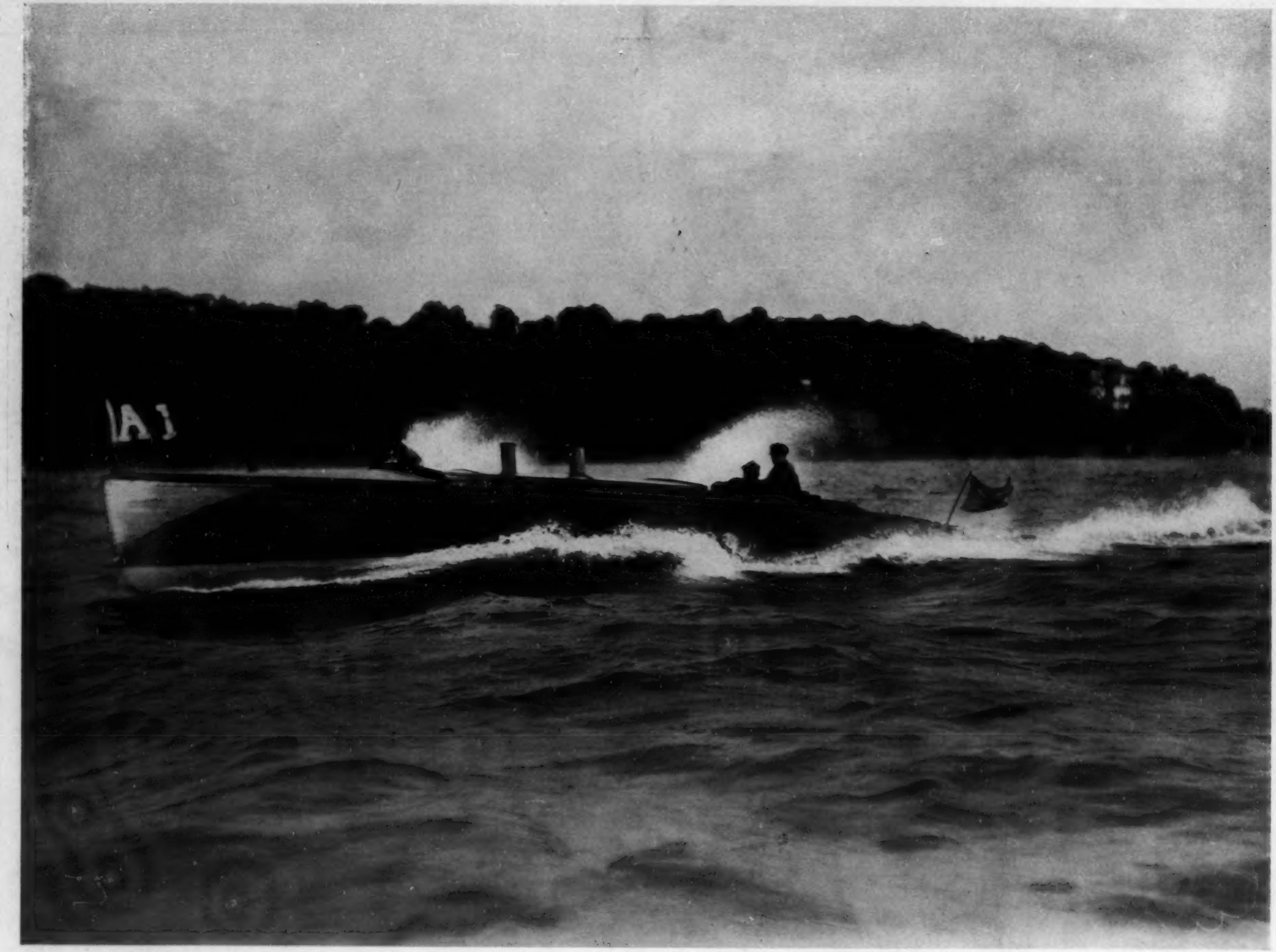
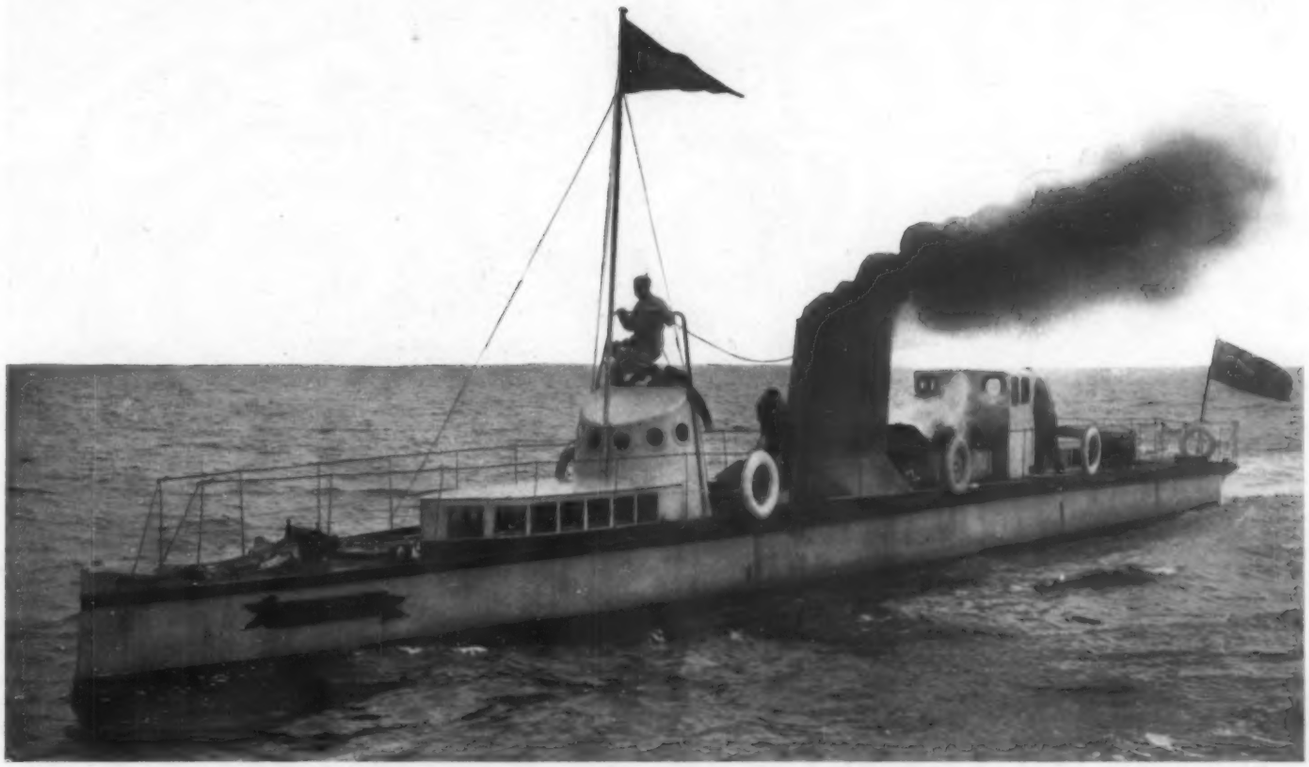


CUTTING A SWELL—DIXIE, THE QUEEN OF THE LAKE WORTH REGATTA.



HIS MAJESTY'S SHIP TURBINIA—THE FIRST VESSEL PROPELLED BY TURBINES.

Record-Breaking Steam Yachts

AMERICANS BEGAN TO LOOK FOR HIGH SPEED IN THE DAYS OF THE REVOLUTION, WHEN, IN PHILADELPHIA, JOHN FITCH BUILT A "STEAM OARED" CRAFT—THE SPEED DID NOT COME THEN, BUT THE WAY WAS PAVED—THE FULTON AND FLYERS OF A LATER DAY—THE HUMILIATION OF THE MARY POWELL, AND WHAT THE YEARS HAVE BROUGHT

By HENRY IRVING DODGE

THE torpedo-boat and the camel-back are cousins. You will wonder why, since Fitch, an American, was grandfather to one, and Stephenson, an Englishman, to the other. Here's the secret—Watts was their common ancestor. You will ask, "Who was Fitch?" and so betray an appalling ignorance of an event that did more to shape history than did the ambition of Napoleon. For the steel fish has brought Liverpool as close to us, in days, as the iron horse has brought San Francisco. Such ignorance is the more conspicuous, this being the centennial of Fulton's success, when everybody is discussing him. The writer is prepared to tell all about Fitch, since he first learned of him two weeks ago in Morrison's History of American Steam Navigation.

BUZZ, NOW YANKEE DOODLE, 29.6 MILES PER HOUR.

It is a funny incongruity, that of a "high-speed Yankee" looking for appreciation in Philadelphia. Yet, John Fitch, of Connecticut, sought it there. Fitch had a "crazy notion" that he could make a boat so buoyant that she would float a furnace, boiler and engine big enough to propel her. Preposterous! The idea savored of the perpetual motion lunacy, that constant ticket to the mad-house. But Fitch being harmless, they did not lock him up. And so he went to Philadelphia.

In a letter to the "Columbian Magazine," of December, 1776, Fitch writes of his invention—the first boat moved by steam in the United States:

"It is, in several parts, similar to the late improved steam engines in Europe, though there are some alterations. Our cylinder is to be horizontal, and the steam is to work with equal force at each end. The mode by which we obtain what I take the liberty of terming a vacuum is, we believe, entirely new, as is also the method of letting the water into it and throwing it off against the atmosphere without any friction. It is expected that the engine, which has a 12-inch cylinder, will move with a clear force of 11 or

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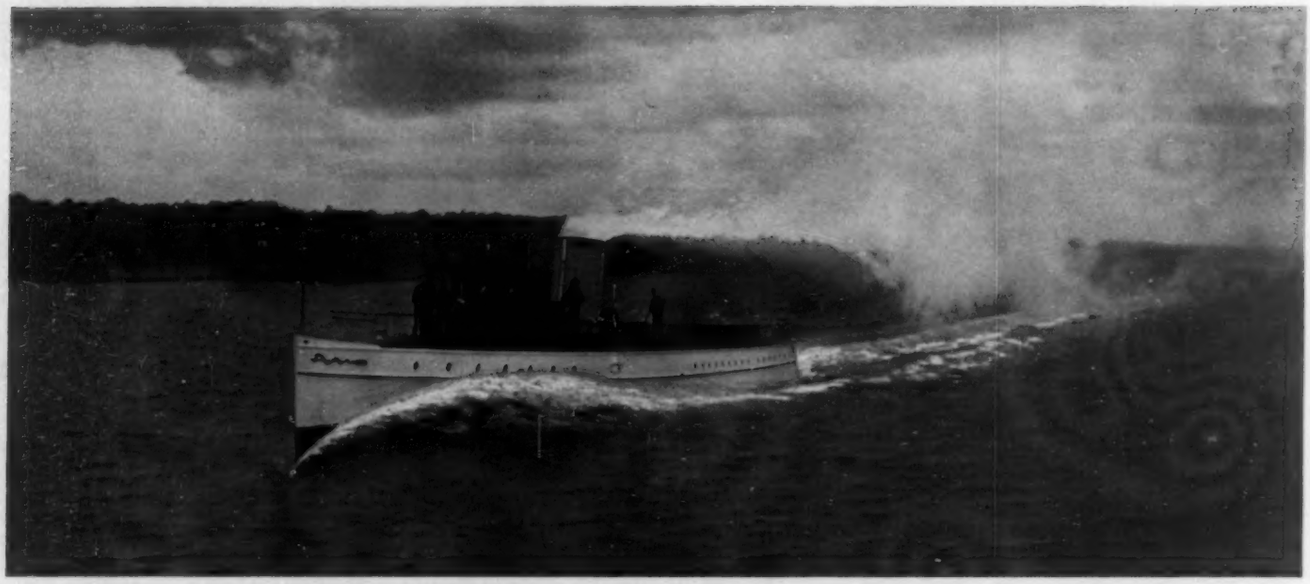


ARROW MAKING OVER 45 MILES AN HOUR—THE SWIFTEST STEAM YACHT IN THE WORLD.

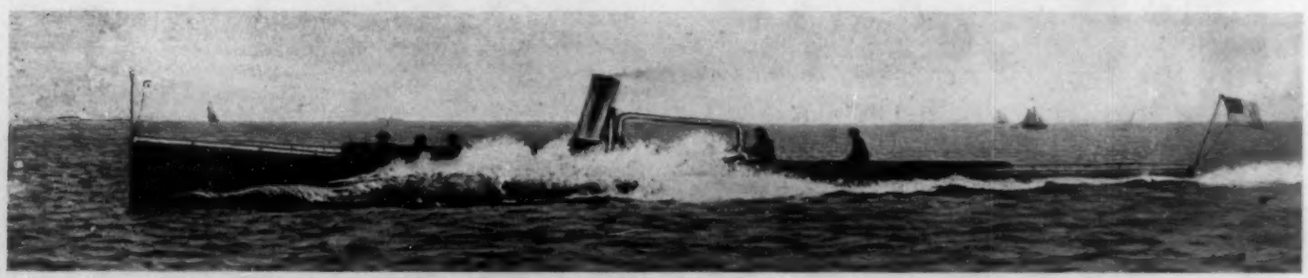
12 cwt., after the frictions are deducted. The force is to act against a wheel 18 inches in diameter. The piston is to move about 3 feet, and each thrust will give the axis about forty revolutions. Each revolution moves twelve oars or paddles 5½ feet, which work perpendicularly, and are represented by the stroke of the paddle of a canoe. As six of the paddles are raised from the water, six more are entered, and the two sets of paddles make the strokes about 11 feet in each revolution. The cranks of the axis act upon the paddles about one-third of their length from the lever end, on which part of the oar the whole force of the axis is applied. Our engine is placed in the boat about one-third from the stern, and both the action and reaction turn the wheel the same way."

This boat was built by Brooks & Wilson, in Philadelphia. She was 45 feet long, 12 feet beam, and made 3 miles an hour on her trial trip. They were evidently a long time adjusting the invention which Fitch describes in the "Columbian," since her speed was first tested in August, 1787. Three miles an hour was not enough, and they broke her up and put some of her machinery in a bigger boat, Perseverance. Perseverance was 60 feet long, 8 feet beam—note the change of proportions—and 4 feet draft. This boat made the trip from Philadelphia to Burlington in three hours and twenty minutes. Apparently Philadelphia approved of her, since David Rittenhouse wrote: "The boat was worked against both wind and tide, with a very considerable degree of velocity, by the force of steam only." Another son of the Quaker City, Andrew Ellicott by name, takes occasion to say, after inspecting the boat: "I am now fully of the opinion that steamboats may be made to answer valuable purposes in facilitating the internal navigation of the United States, and that Mr. Fitch has great merit in applying a steam engine to so valuable a purpose."

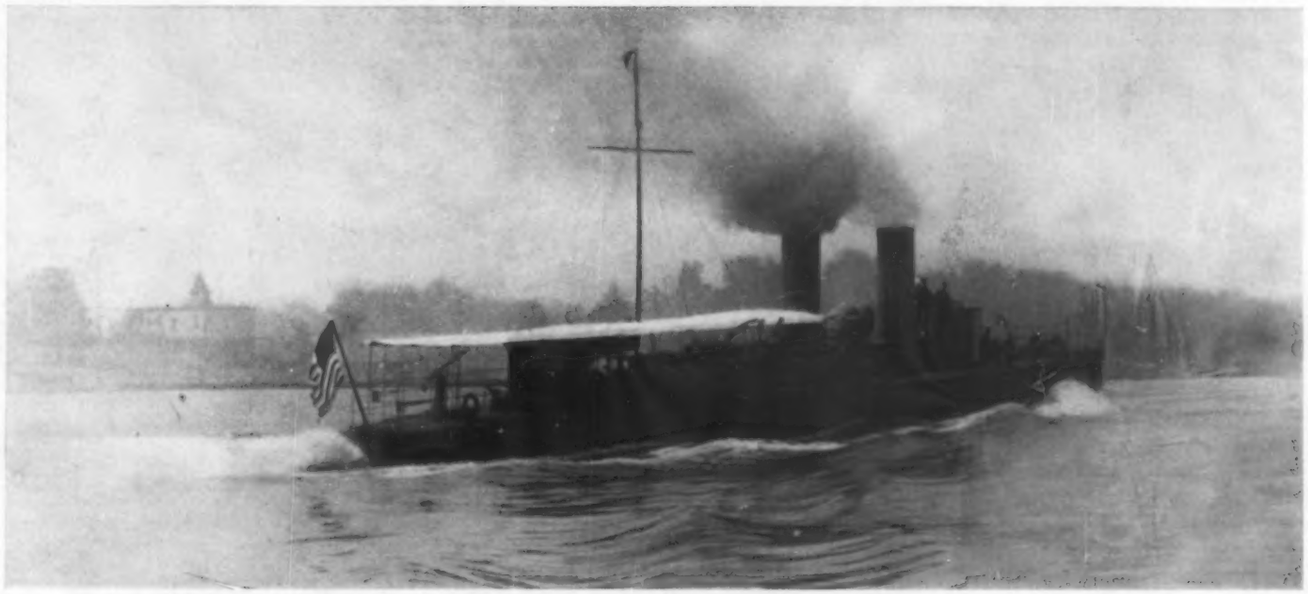
According to Morrison's history, Fitch continued his experiments, and actually did produce, in 1789, a boat that made 8 miles an hour. In 1796 we find him operating a common yawl boat filled with crude machinery on Collect Pond, where the Tombs now stands. Here he is said to have tested both side-wheel and propeller theories. I would like to draw the curtain here, but truth compels. After suffering much poverty and distress, Fitch finally died in Bargetown, Ky.—by his own hand. Like all men of the inventor type, Fitch was immensely superior, mentally, to 99 per cent of his countrymen. But he had to suffer ridicule, distrust, pinching want, and lack of sympathy, the inevitable story of the tragedy of genius.

About the only recognition Fitch got was that accorded him by Dr. William Thornton, director of the Patent Office, Washington, D. C., who wrote, in October, 1815: "Finding that Mr. Robert Fulton, whose genius and talents I highly respect, has been by some considered as the inventor of the steamboat, I think it a duty to the memory of the late John Fitch to set forth, with as much brevity as possible, the fallacy of this opinion, and to show, moreover, that if Mr. Fulton has any claim whatever to originality in his steamboat it must be exceedingly limited."

Notwithstanding the foregoing endorsement of Fitch's claim to priority of invention, the first successful steamboat in the world



NORWOOD, WHICH DID 30 MILES AN HOUR WITHOUT HALF TRYING.



TARANTULA TUNING UP FOR RACE WITH NIAGARA IV.

was launched by Robert Fulton in the spring of the year 1807. She was built by Charles Brown, was 140 feet long, and was named the North River Steamboat of Clermont.

The first steam launch in America about which anything is known was built by Mr. Charles Haswell in the Brooklyn Navy Yard in 1837. Mr. Haswell called her Sweetheart. She was 35 feet long, 4 feet wide, and had a curious little walking beam engine and two paddle wheels 36 inches in diameter. Sweetheart made only five and a half miles an hour—not much to speak of, considering that that was nearly forty years after Fitch died. But evolution had not then got under full headway.

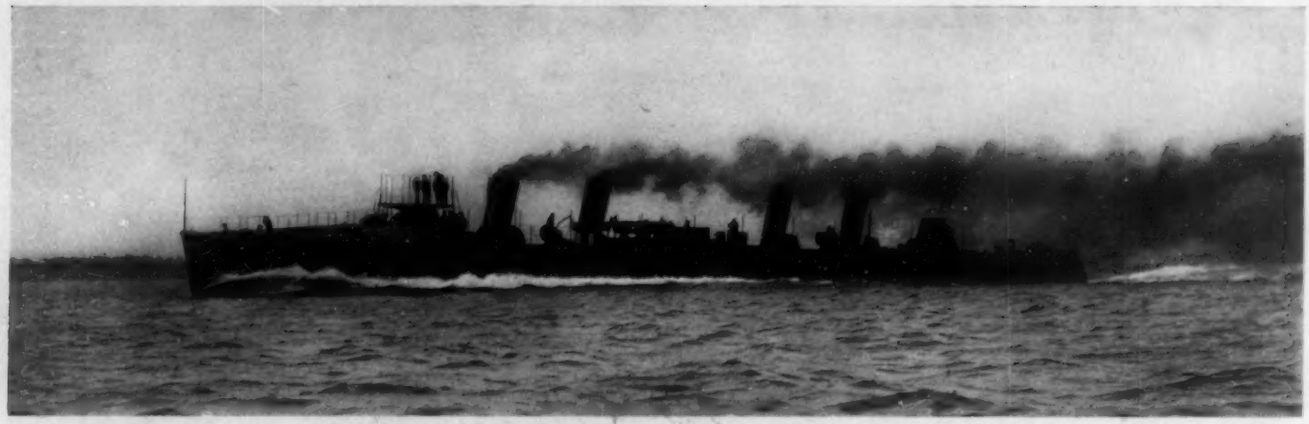
Not for half a century did anything in the evolution of the steamboat happen. She grew by the inevitable demands of commerce. Great flat-bottomed structures, torch-lit and fire-sprayed, raced on the Mississippi with negroes on the safety valves. The queenly Mary Powell pursued the swanlike tranquility of her way on the Hudson, save when some impudent craft challenged her supremacy, when she would get up a 20-mile gait just to show what she could do.

"All went well until one day
Strange fish came in the bay."

W. K. VANDERBILT, JR'S, TARANTULA IN DRYDOCK.

It was a notable morning in August that the passengers on the Powell observed a curious-looking craft approaching from astern—from astern, mind you, and—*approaching*. The Powell allowed the stranger to overhaul her. Then a spirited race began. The big boat put on another mile. The stranger tenaciously clung to her ribs. Still another mile the Powell put on, but the relative positions of the boats changed no more than if the one had been towing the other. Hot messages were exchanged between pilot house and engine room on the big steamboat. Her paddles beat the water harder than ever before. It was not now a matter of punishing the impudence of the stranger, but of preserving her own matchless record. Desperately she struggled, desperately she—ah, the little boat had abruptly quitted the race. And now it dawned upon the Powell that she had been used as a pacemaker. In fact, those inscrutable Yankees, the Herreshoffs, had simply been testing the speed quality of their Stiletto.

The Stiletto's feat on the Hudson "touched things off." The high speed era was on. This was in 1885. A month after racing the Powell, Stiletto made 80 nautical miles in four hours and fifty minutes. The craft that now had the



UNITED STATES TORPEDO BOAT DESTROYER BAILEY MAKING 35 MILES AN HOUR.

world by the ears was a 94-footer, with an 11-foot 4-inch beam, and was built of wood. She was used by her builders till 1888, when the government took her over and attached her to the torpedo station at Newport.

In 1886 the Herreshoffs turned out another success, the 48-footer Henrietta, which covered the Larchmont-New London course in five hours twenty-three minutes. The next year the same builders launched Now Then, an 86-footer, but she did not pass muster, and they took her back in partial payment for Say When, a much bigger boat. But she, though serviceable, proved a disappointment to her owner, Mr. Norman L. Munro.

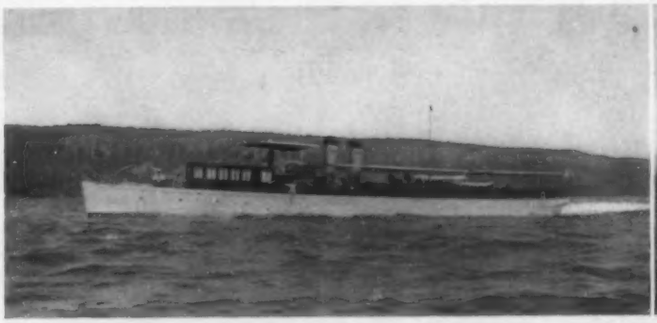
From the time Stiletto was launched until 1887 the Bristol men had the high-speed field to themselves. But now a young Massachusetts man, Mr. C. D. Mosher, entered the field with Buzz, a 50-footer. Buzz had a ram bow, and on trial made a mile in two minutes eight seconds. Mr. Mosher sold her to the McBride Brothers, of Philadelphia, who re-named her Yankee Doodle and pressed her into service on the Delaware. By this time the abnormal had become the usual. Twenty-mile small craft were common. High speed was a fad. The utilitarian New Yorker put it to use in business—established private ferries from the city to all reachable water points. Thus the movement received a commercial stimulus—and everybody knows what that means.

The fast launch was a boon to the business man. It brought him to the city with his lungs full of ozone and his blood tingling with the excitement due to high speed. It gave him something to look forward to. Instead of working through the hot day with the soot and stench of a tunnel for his punishment, he was to get a blood-spurring spin down the bay or up the river. It would be interesting to trace the ramifying influences of the high-speed steam yacht. But that is another story.

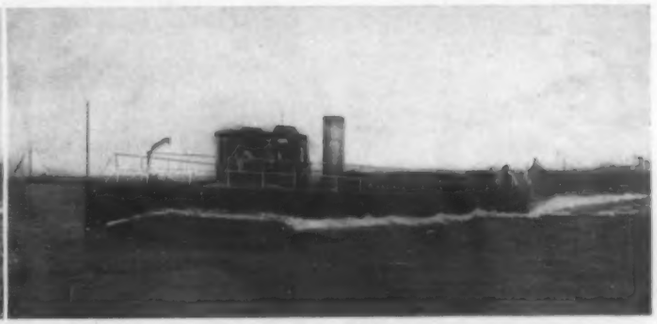
ELLIDE, 40 MILES IN 60 MINUTES—SOON AFTER HER LAUNCHING SHE MADE LIFE UNPLEASANT FOR THE GRAVE AND REVEREND "SENIORS" OF THE WATER WORLD.

At this period the battle for ascendancy seems to have been between Mosher and the Herreshoffs. Mr. Munro, because of the success of Buzz, ordered Mr. Mosher to build Norwood, stipulating that she should be the fastest boat in the world. It was the hobby of this enthusiast to keep ahead of everybody else. Norwood was launched in 1890. She was 63 feet long and had

A CLEVER "FAKE" PHOTOGRAPH MADE FROM A MODEL OF ARROW ALTERED TO A TORPEDO BOAT.



VITESSE, OWNED BY MR. BRAYTON IVES, 29⅞ MILES PER HOUR.



FEISEEN, THE MONMOUTH'S BETE NOIR, 31.6 MILES AN HOUR.

a 7-foot 3-inch beam and a 4-foot extreme draft, and was decked over 12 feet forward and 10 feet aft. She proved to be a veritable "whizzer." But the public, having acquired marked adjustability to lightning changes, paid little attention to the great speed of the boat. Without developing more than a quarter of her 400 hp, Norwood did 20 miles. Nor was she a mere sprinter. She had the endurance of an Empire State Limited. One day she amazed the passengers on the Monmouth by beating the Sandy Hook flyer, despite her record of 22 statute miles an hour. In six minutes the yacht led the passenger boat by half a mile. This achievement stimulated the sporting proclivities of the officers of both boats to the extent that Chief Engineer Riley, of the yacht, offered to bet the captain of the Monmouth that he could beat him five miles from city to Hook.

In 1891 the Herreshoffs launched Javelin and Vamoose for Messrs. E. D. Morgan and W. R. Hearst, respectively. Javelin was a 97-footer. She did not show great speed, however. But Vamoose proved to be a "goer." Her length was 112 feet and her beam 12 feet 4 inches. On trial she made 22.6 miles an hour. Let it be understood that great bursts of speed are usually made over a one-mile course under the most favorable conditions, such as fair weather, and the like. Also, a boat is not weighted down on such an occasion with more fuel than to get up speed and push

(Continued on page 244.)

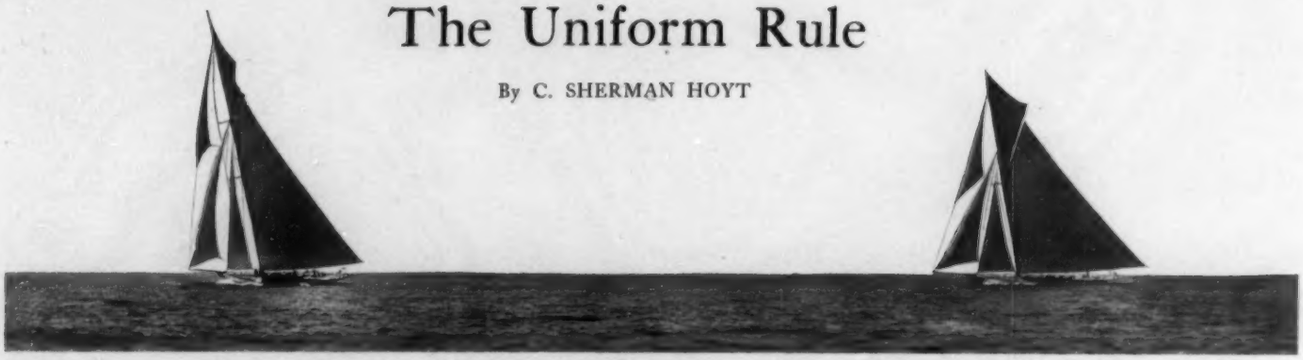
NIAGARA IV., OWNED BY MR. HOWARD GOULD.

WAUNETA, RUNNING 31 MILES PER HOUR.

VAMOOSE, 22.6 MILES AN HOUR—SHE FIRST DEFEATED THE MARY POWELL.

The Uniform Rule

By C. SHERMAN HOYT



AN IMPORTANT QUESTION—IS OUR PRESENT MEASUREMENT RATING APPLICABLE WITH A SUFFICIENT DEGREE OF ACCURACY TO FORM A JUST BASIS FOR RATING AND TIME ALLOWANCE?

YACHTS shall be rated for classification and time allowance according to the following formula: Rating Measurement $= \frac{L \times \sqrt{SA}}{5.5^{s}\sqrt{D}}$;" so reads the first clause of our measurement rule. Then follow directions as to how these various factors are to be obtained.

Where races for valuable prizes and still more precious prestige are often decided by a few seconds, the basis for rating and time allowance should be accurately determinable. Leaving aside all question as to the merits or demerits of the principles and the proportionment and limits of the factors in the present rule, it, as now worded in the directions for obtaining the different factors, cannot be applied with sufficient exactitude to establish ratings, slight variations in which may cause such important results. Last summer the two chief yachting events open to large boats were decided by very narrow margins of time. The King's Cup, won by Effort by nine seconds, would have gone to Queen had the former rated .06 of a rating foot greater, and the Astor Cup would have gone to Phryne instead of Weetamoe by sixty-three seconds, had the little boat rated .15 of a rating foot lower.

Measurers are directed to obtain the length, sail area and displacement in certain ways. Let us examine the possible variations in each in turn, and their effects upon the final rating. (In the examples that follow use has intentionally been made of the lines of a boat which has not been built, as it was not deemed altogether wise to show the possible variations in any particular existing craft. This boat was, of course, worked out for the present rule; it would rate in the "Q" class, and is not extreme save in having a rather large displacement, which would have no effect upon the conclusions reached in the following experiments. Her size is small, but the variations in the different factors as found may be assumed to be practically proportional for all sizes.)

"Length.—L, measured on a line parallel with the middle fore and aft vertical plane at a distance from it equal to one-quarter of the greatest beam (B) at the load waterline, and one-tenth of this beam (B/10) above the waterline." This sounds and is difficult to obtain, as the surface of the water is seldom still, and a rather elaborate system of floats, sighting lines, plumb bobs, etc., is necessary. It is within the option of the measurer to leave this to the designer to determine from the lines, having first furnished the latter with sufficient data to fix the line of flotation of the boat. In most cases where the writer has been called upon to make measurements, and where the designer has been asked to furnish the displacement, a request for L has also been made, after this had been first measured as accurately as possible on the boat itself. So far, possibly largely through luck, the L, as observed on the boat and as given by the designer from their plans, has not varied in any one case over one inch. This is, in all likelihood, as accurately as it is possible to measure this factor, either from the boat or from her lines, since the line of L cuts the top sides at a very sharp angle; therefore, one may say that, provided the weather conditions are satisfactory, L, for any particular trim of the boat, is determinable either from the boat or from her plans with a sufficient degree of exactness.

Let us now examine the effect of changes in trim upon L. The only clause relating to trim with which the measurer is concerned is as follows: Rule II., Article 6. "Trim.—All measurements of hull shall be taken with only such persons on board as shall be required to assist the measurer." There are further restrictions dealing with racing and cruising trim, but these are separate and absolutely independent from the rules dealing with measurement and fall within the province of the race committee. It is perfectly optional as to whether measurement shall be taken with all fittings, supplies, boats, extra gear, etc., on board or not. Water tanks may be full or empty; gear may be placed in the extreme bow, amidship or in the stern; extra weight might be put on board for trimming purposes, or the boat skinned down to the bare hull quite at the will of the owner or captain. Does this alter the boat's rating? It seems worthy of some consideration.

The formulators of the rule evidently went upon the principle that in the average modern craft L approximately varies as the cube-root of the displacement. This holds, it is true, if the center of gravity of the added or subtracted weight is kept in the same perpendicular line as the center of buoyancy of the hull, so that no change in the relative trim of the bow and stern results. In the 22-rater which we are to use as an example, an addition or removal of about 400 pounds would submerge or emerge the boat about one-half an inch from her designed waterline; in one case L is increased and in the other decreased approximately 3 inches, but in neither case is the rating altered more than .01 of a rating foot. Of course, in a craft with no overhangs and perpendicular top-sides L would not change at all, no matter how the displacement (D) was varied; but there is little fear of such a rule-evader being built, although there are undoubtedly some cases of boats with sharp waterlines and little flare to the top sides at the ends where the rating could be somewhat reduced by adding weight to increase the D. Now, however, suppose that we keep to the designed displacement, but move our anchors, gear, etc., pretty well forward, empty any water tanks that may be aft, and, if there is one forward, fill it; say that this submerges the forward end of the waterline 1 inch, case No. 2, or 2 inches, case No. 3; measure L, and solve for rating, $5.5 \times \sqrt[3]{D}$, and the $\sqrt{SA}$ remaining constant. In case No. 2, L is decreased 1¾ inches, and in case No. 3, L is decreased 4 inches, owing to the fact that the waterlines for-

ward are finer than aft, and that the buttock line through B/4 is steeper forward than aft. The change in the rating effected is as shown in the following table (case No. 1 is the designed condition):

CASE.	Trim.	Length.	$5.5\sqrt{D}$.	$\sqrt{SA}$.	Rating.	Rating for Time Allowance.	Time Allowance per Mile in Seconds.
No. 1	Designed.....	L.....	31.68	S	21.99	22.	Scratch.
No. 2	1" by the head...	L-1½".....	31.68	S	21.86	21.9	1.23
No. 3	2" by the head...	L-4".....	31.68	S	21.69	21.7	3.7

Quite a difference this, and case No. 2 is a very likely one, as it would not require any very radical stowage of gear to effect that much change in the trim. Case No. 2 would mean an increase in the time allowance received or a decrease in that given over the Astor Cup course of 47 seconds, a rather improbable length of race for a 22-footer; but if the rating of a 55-footer were reduced proportionately her time allowance would be changed by 29.64 seconds, and in case No. 3 by 1 minute and 35 seconds. These ratings would be increased by about the same degree if the boat was trimmed by the stern, and we might have differences in ratings corresponding to double the above time allowances from the boat in the worst condition to the same boat in the best condition of trim, displacement and sail area remaining constant.

So much for L, the first factor in the formula. Sail area, the second, presents no difficulty to the measurer; the directions are full, readily followed, and leave no excuse for inaccuracies in the computation of the area according to the rule.

Displacement, or D, the third factor, is to be obtained as follows: "At points dividing the length of the load water-line into five equal parts, find areas of immersed cross-sections in square feet; from the areas in square feet obtained and load waterline length find the approximate displacement in cubic feet, which will be the D in the formula"; or the measurer may accept the designer's calculation for D, having supplied him with sufficient data to fix the line of flotation. In either case what will the method of procedure be? Take the predicament of the designer first. Will he divide the waterline into five equal parts, draw the four cross-sections and compute the D in one of several different ways, which are apt to give results varying considerably, or will he, correcting for any change in the load waterline, take it from his line plan as already drawn, with sections spaced according to his custom in working out the design either by Simpson's, Tchebycheff's or the trapezoidal rules? Knowing that any method of obtaining the D from the four sections is only approximate, and may be made to vary in either direction, he will probably take the actual displacement from the lines, as in case No. 1. If he tries to work to the letter of the rule, after getting the area of the four specified cross-sections with a planimeter how will he proceed? Several methods are open to him. Unfortunately, none of the usual rules for computing the area under a curve are directly applicable where the length of the base and the values of the four ordinates which divide it into five equal parts are given, which is the condition with which he is working, the length waterline being the base and the areas of the four cross-sections being ordinates of the displacement curve. He may, however, use Simpson's first and second rules in combination, commencing at the bow with the first rule for the two forward spaces and applying the second for the remaining three, with a result as shown in case No. 4; or he may start at the stern and reverse the process, case No. 5; or he may do both and take the mean, case No. 6; or he may draw the curve of displacement by means of a batten passing through the four known spots of the curve and compute the area under it with a planimeter or by one of the usual rules, case No. 7. All these methods are perfectly open to him, and that his choice may make quite a difference will be seen by consulting the following table:

CASE.	Length.	D.	$5.5\sqrt{D}$.	$\sqrt{SA}$.	Rating.	Rating for Allowance.	Allowance in Seconds per Mile.	Corresponding Rating for 55 Rater.	*Change in Allowance 55 Rater.
No. 1	L	191.16	31.68	S	21.99	22.	2.43	55.	59 sec.
No. 4	L	193.23	31.8	S	21.92	21.9	3.66	54.75	1 min. 28 sec.
No. 5	L	184.87	31.328	S	22.24	22.2	Scratch.	55.5	Scratch.
No. 6	L	189.05	31.565	S	22.08	22.1	1.21	55.25	29 sec.
No. 7	L	193.89	31.829	S	21.89	21.9	3.66	54.75	1 min. 28 sec.

* The figures in column 10 give the change in allowance for a 55 Rater correspondingly changed in rating, over the Astor Cup Course of 38 knots.

As seen above, the figure for the displacement as furnished by the designer may vary and largely affect the final rating. Can the measurer obtain it any more accurately? He must, of course, either take the areas of the four sections from the boat and calculate the displacement from them, or he may take it from lines furnished by the designer in the extremely unlikely case that the latter is willing to lend the lines to the measurer, who probably is a rival designer. Assuming that the boat is hauled out, it is rather improbable that even if he knows and has marked the exact position of the line of flotation on the boat, that he can divide the load waterline into five equal parts and at these points measure the four sections. Owing to the blocking and cradle under the boat, he will have to take sections where he can most readily measure them with accuracy and later prepare a set of lines from them. He now is in exactly the same position as the designer when asked to furnish the displacement; all the methods which were open to the latter for obtaining the displacement are open to him, and he is liable to obtain just as uncertain results.

So far, we have only considered the effect upon rating caused by slight variations in trim and by the method chosen for obtaining the displacement separately. There are a great number of possible combinations of the two; but, as an example, let us combine cases No. 2 and No. 7, which will not give us the smallest possible rating, but one due to a set of conditions quite liable to occur, and compare it with case No. 1, the designed one, and with case No. 5, which, so far, has given the greatest rating:

CASE.	Length.	$5.5\sqrt{D}$.	$\sqrt{SA}$.	Rating.	Rating for Allowance.	Allowance in Seconds per Mile.	Corresponding Rating for 55 Rater.	Allowance Over Astor Cup Course for a 55 Rater.
No. 1	L	31.68	S	21.99	22.	2.43	55.	59 sec.
No. 2	L	31.829	S	21.07	21.7	6.13	54.25	2 min. 27 sec.
No. 7								
No. 5	L	31.328	S	22.24	22.2	Scratch.	55.5	Scratch.

These tables show, then, that there is not only a possibility, but a probability, of arriving at widely differing ratings for the same boat, due to the latitude allowed in the trim of the boat and to the choice in methods given to measurers by which they may figure the displacement. If the present rule is to remain in force, would it not be well to stipulate that measurements shall be taken with the boats in racing trim, with all gear, fittings, etc., in their proper places, that water tanks shall be empty, and that D shall always be calculated in the same way by some stipulated method?

EDITOR'S NOTE.—It is the intention of YACHTING, throughout the coming months, to print the views of various designers and measurers as to the uniform rule, based on results obtained in the approaching season. This magazine need not necessarily be understood as upholding any one opinion advanced in its pages, but it does believe that broad and general discussion can result in nothing but good. Admittedly, the rating rule as it now stands is in a more or less tentative state, and positive assertions until the races of next season, and everything appertaining thereto, have been studied, are hardly in order. While YACHTING has certain men in view as contributors to this discussion, the opinions of any yachtsman who feels qualified to speak will be welcome.

CAPTAIN OF S. S. PERSIA, FLAGSHIP OF THE P. & O. LINE.

OFFICER OF DECK AND QUARTERMASTER, S. S. WERRA, IN MID-OCEAN.

FIRST OFFICER TAKING THE SUN, S. S. WERRA. TAKEN AT NOON IN MID-OCEAN.

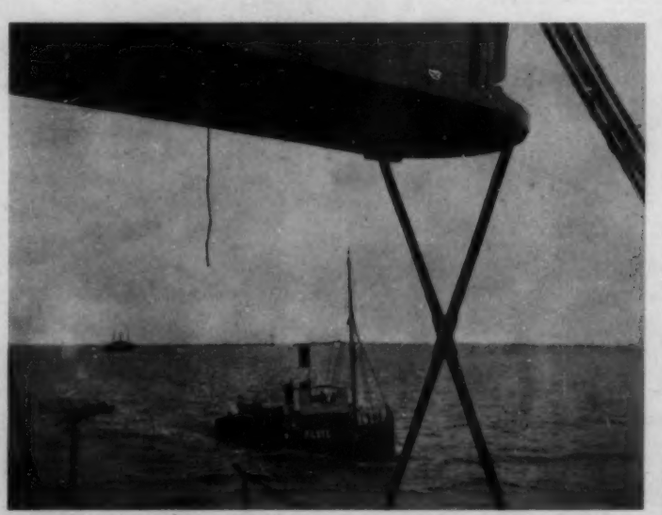
Navigation

EXPERIENCE OF AN AMATEUR IN PRACTICAL WORK AT SEA

By FRANK S. HASTINGS

Photographs by the Author

IN consenting rather reluctantly to relate my experiences in practical navigation at sea, the fear of evoking criticism from the professional reader for my omission of scientific technicalities is in a measure offset by the hope that I may be able to throw some light upon a subject which always interests those who are fond of the sea. Therefore I must beg the indulgence of the sea captain (being myself a plain ordinary business man) if, to the uninitiated, I appear to pose as a professional navigator, a presumption which I must emphatically disclaim. In this dual position I am reminded of the old Scotchman who was professor of astronomy and geology in the Edinburgh University. During the summer vacation it was his great delight to travel on the continent and to call upon any of the great astronomers and geologists he happened to find. Conscious of the fact that his store of knowledge of both subjects was not quite abreast of the times, he had two sets of visiting cards engraved. When calling upon a professor of astronomy, he sent in his card as professor of geology, Edinburgh University; but when he called upon a geologist he used the other card which represented him as an astronomer.



PORT SAID—OFF THE MOUTH OF SUEZ CANAL—A FRENCH PILOT BOAT.

As distinguished from seamanship, navigation may be termed the science of locating the position of a ship at sea and conducting a vessel from one port to another. Seamanship proper is the art of handling and managing a vessel in any kind of weather, under all conditions and in any emergency. It is therefore obvious that seamanship can only be acquired by long practical experience. For example, a graduate from a naval academy may have a thorough knowledge of the mathematics and entire practice of navigation and yet be entirely incompetent to handle a ship in a gale of wind or in any emergency; whereas a man, by long experience, may acquire proficiency in seamanship with no knowledge of navigation. Hence, to be master of a vessel, a man must learn navigation from books and seamanship from actual service at sea.

As an amateur, I would divide the science of navigation into three branches, viz., "Coast Pilotage," "Dead Reckoning" and "Deep Sea" work. Coast pilotage covers "chart

STEERAGE PASSENGERS, S. S. POSEIDON.

ARABS IN THE STEERAGE AFTER THEIR MORNING PRAYERS ON DECK.

ONE OF THE "MESSAGERIES MARITIMES" SQUADRON.

sailing," which includes the art of navigating a vessel along the coast or within sight of land by the use of compass, chart, parallel rulers, etc. By this means the navigator may take a vessel from port to port, laying courses, estimating distances, and the like. "Dead reckoning" applies to the management of vessels off shore (out of sight of land) when it is impossible to get sight of the sun and includes, principally, the regulation of courses by compass, and estimating distance run by the taffrail log, or in the case of a steamship, by counting and recording the revolutions of the engines. In the transatlantic service, where the courses are easterly and westerly, the compass course determines the latitude, while the distance run, as estimated by the revolutions of the engines, determines the longitude. At noon each day the position of the ship and the distance run are posted in the saloon or companion way and marked "By Observation" if determined by the usual sights of the sun, or "D. R." if estimated by dead reckoning.

"Deep sea" navigation involves the use of the sextant for the observation of the sun and planets, from which the position of a vessel out of sight of land may be accurately determined at any time and in any part of the world.

As an amateur navigator my experience in seamanship commenced with learning to sail a small boat before I was ten years of age. My early sailing was confined mostly to the Shrewsbury River, with an occasional venture outside Sandy Hook. My first boat was a 12-foot dinghy with a sprit sail, then a 16-foot flat-bottom skiff rigged with a sprit mainsail, a rag of a jib and a "lee board" which, of course, had to be shifted every time we went about. From this I was graduated to a 23-foot, round bottom, shallow draft, centerboard cat boat, known in those days as a "sand-bagger." A long series of the usual accidents experienced by a boy in a small boat culminated in my being capsized in a fierce squall near Sandy Hook, on which occasion I was six hours in the water before being picked up by a steamship. But we learn more by our failures and mistakes than we do by our successes, and I always feel that my cautiousness and consequent freedom from accident in later years are attributable to the experience gained from the accidents of early youth.

Having acquired a good knowledge of the elements of seamanship, coast pilotage, involving a knowledge of the "rules of the road," became a most interesting and an easy study. It has been my good fortune to be invited frequently to make the trip down Long Island Sound in the pilot house of a night boat. The safety of these boats is by no means attributable to good luck, but is due to rigid discipline and adherence to the best known systems of coast pilotage. I was at first surprised by the careful routine observed on a clear, bright night, when the usual log and record would seem superfluous. After passing through the narrow and tortuous channels of Hell Gate and the East River, making the sharp turn around Fort Schuyler and passing the dangerous reef known as "Stepping Stones," marked by a fixed red light to starboard, we lay our course for "Execution Rock," at the entrance to the Sound, marked by a white light flashing every 10 seconds. Thence the departure is taken and the course laid by compass for Middle-Ground light on Stratford Shoals, located in the middle of the Sound off Bridgeport. Eight miles east of Execution we pass Captain's Island, upon which is fixed a white light, off Greenwich, Conn. Here an entry is made in the log giving the revolutions of the engines. Five miles beyond we pass a fixed red light off Stamford on the port hand. Then Eaton's Neck, a fixed white light on the starboard, and further along on the port, Green's Ledge light, near Norwalk, flashing alternately red and white. Then after passing the red light flashing every 5 seconds on Penfield Reef (Black Rock) we find Middle Ground abeam with a light flashing white every 10 seconds. Thence the course is laid by compass for the Race, passing Falkner Island to port, with its white light flashing every 15 seconds. Approaching the Race (the eastern entrance to the Sound) we soon sight, on the northern side of the narrow passage, Race Rock light, flashing alternately red and white every 10 seconds, and on the south side the fixed white light on Little Gull Island. Passing between these we find ourselves out in the open ocean and lay our course for Point Judith, on which there is a powerful white light flashing every 15 seconds. Leaving Point Judith to port we bear northeast and head for Newport harbor, passing between Brenton's Reef lightship on the starboard and the white flashlight on Beavertail on the port hand.

From the foregoing it will be readily understood that with the distinguishing character of each light it is impossible to mistake one light for another, and that, by reference to the chart, which gives a full description of each light, the navigator or pilot will always be able to determine his exact position in clear weather; and in a fog the lighthouse steam whistle, with varying durations and intervals, will not only warn the vessel of danger but, by reference to the chart or book of sailing directions, the exact name and location of the light may be determined. During every run one of the pilots keeps an exact record of the engine revolutions and notes on the log the direction of the current or tide, the conditions of the weather, etc., so that when running in a fog the compasses direct the course and the revolutions of the engines determine the distance run, from light to light. I have often marveled at the accuracy of these calculations in navigating one of the Sound steamers in a fog, and as the principal boats on the route are not insured, the skippers are most cautious about running into any possible danger.

In our coasting trade the same general practice of "coast pilotage" prevails with vessels bound out of New York for ports north

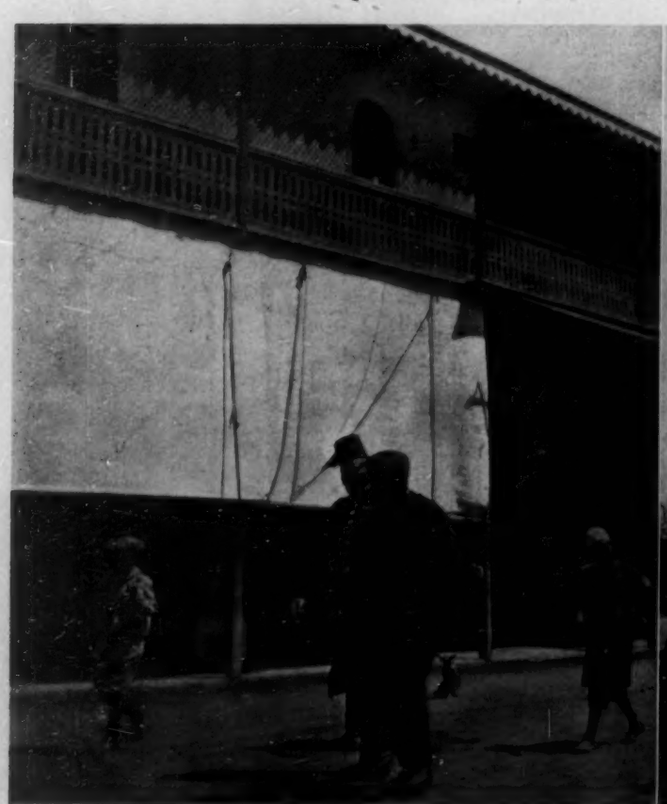
of Cape Hatteras, although vessels bound for ports south of Hatteras use the deep sea methods with sextant and chronometer. Taking our departure from Scotland lightship, 3 miles off Sandy Hook, we pass consecutively a flashing red light at Sea Girt, a flashing white light at Barnegat, a fixed white light (Absecon) off Atlantic City, Northeast End lightship (red and white) off Cape May, and so on down the coast. Revolutions are counted and recorded from light to light, and with the data thus secured distances run are accurately determined in the thickest fog. On one occasion, on board a steamship bound for the West Indies, just before we left the New York dock the skipper was notified that the Diamond Shoals lightship, anchored 15 miles off Cape Hatteras, had broken adrift in a heavy northeast gale. As we approached the locality of the dangerous shoals at about nightfall, Hatteras light was obscured by a haze; so the lead line was set at 18 fathoms and the lead hove at frequent intervals. When bottom was touched we followed the 18-fathom line until the water deepened, and so determined the location and time of passing Hatteras. This calculation was proved by the usual meridian observation of the sun the next day. In fact, it would be possible to navigate a vessel from New York to Florida by soundings alone, so accurate are the markings for depth on the government charts.

My fondness for the water and my interest in the science of navigating along the coast led me at an early date to take up seriously the study of deep sea navigation involving the use of sextant, chronometer and other instruments of navigation. To me these studies were most fascinating and, with a fair knowledge of mathematics, comparatively easy. Having mastered the theory and familiarized myself with the use of the sextant on land with the aid of an artificial horizon I was ready to try my hand at sea.

Of course, the rules on board the transatlantic liners prohibit passengers from going on the bridge or in the chart room, but I have always sailed with a skipper with whom I was well acquainted, and as I take with me my own sextant, charts, parallel rulers, almanacs, books of tables, etc., I only need access to the ship's chronometer, an instrument that I could not conveniently carry along. I always make it a rule never to "loaf" around bridge or chart room, going there only with permission, and even then only when necessary to get the time by chronometer. In this connection I want to acknowledge my indebtedness to such well known and able commanders as Captain Horatio Mackay, late of the steamship Lucania and commodore of the Cunard Line, and Captain A. Albers, late of the steamship Deutschland and commodore of the Hamburg-American Line. The former recently retired on the "age limit" and the latter, as will be remembered, dropped dead in the chart room of the Deutschland off Cuxhaven in the North Sea, after bringing his ship in from 500 miles at sea without any rudder. For both of these men, so eminent in their profession, I shall always entertain a feeling of the greatest admiration and respect, and to them I am greatly indebted for my knowledge of the practical navigation and management of first-class passenger ships in the transatlantic trade.

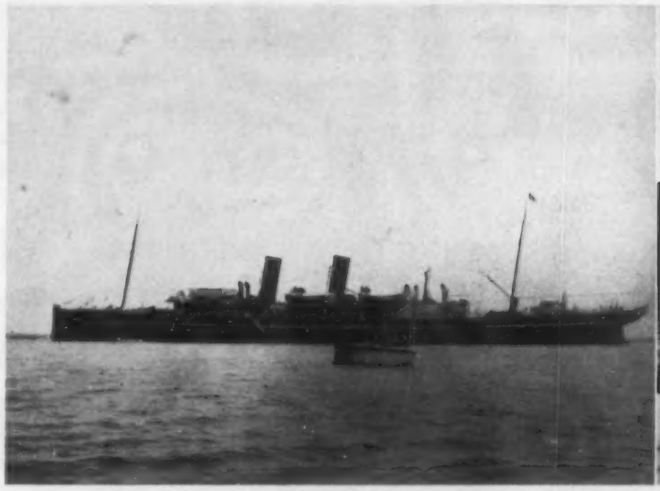
Having resolved to refrain from entering into a dissertation upon the science of navigation, my purpose in this article is merely to recite the experience of an amateur in practical work at sea. For the benefit of the uninitiated, however, I may ask professional indulgence for giving a brief outline of the usual methods employed, with the hope that I may be able to throw some light on the subject which is of interest to so many ocean travelers and understood by so few.

In order to determine the exact location of a vessel at sea we must first ascertain her latitude (i. e. distance from the equator) and then her longitude (distance east or west from Greenwich,



ARABIAN POLICEMAN ARRESTING A DRUNKEN ENGLISH SAILOR IN THE STREETS OF PORT SAID.

S. S. PERSIA CALLING AT MARSEILLES, EN ROUTE FROM PORT SAID TO LONDON.



P. & O. S. S. PERSIA AT ANCHOR OFF PORT SAID.

GUIDES IMPORTUNING PASSENGERS LANDING AT PORT SAID.

Eng.), the point of intersection of these two lines giving the desired position.

As is generally known, the lines of latitude run parallel with the equator, are equidistant, measured in degrees, and commence with zero on the equator, running up to 90 at the pole. A degree measures 60 knots or nautical miles. Hence, 1 degree north latitude would be 60 miles from the equator; 45 degrees north latitude would be half-way between the equator and the North Pole, etc. The method of ascertaining the latitude is comparatively simple. When the sun is at its zenith (high noon) on the 21st of March or the 21st of September, we measure its angle by taking a sight with a sextant and by deducting the angle (or altitude as it is termed) from 90 degrees we find the distance from the equator expressed in degrees. For example, if we are north of the equator and the sextant shows the sun at an angle of 45 degrees, we deduct 45 from 90, which gives us 45 degrees north latitude. If the observation were taken at Sandy Hook lightship the sextant would show the angle of the sun at 49 degrees and 32 minutes. Hence the following calculation:

Polar distance	90° 00′
Observed angle or altitude.....	49° 32′
Difference equals latitude.....	40° 28′ N.

Now, from March 21 the sun is moving north until June 21, when it reaches its maximum declination north. It then moves south; on Sept. 21 it is directly over the equator again, and on Dec. 21 it reaches its maximum declination south. Hence every time we take a noon observation for latitude we make an allowance for declination, which is given in the nautical almanac for every day in the year. It will be readily understood that as the lines of latitude (being parallel with the equator) run east and west, the latitude on easterly and westerly courses determines the compass course; i. e. if we take our departure from Sandy Hook lightship in latitude 40° 28′ north and steer due east we land on the Portuguese coast in the same latitude, or in the neighborhood of Oporto. But if we are bound for the Irish or English coast we steer north of east, and therefore our daily observations for latitude as we proceed in an easterly or westerly direction check our compass course. Now when we have ascertained our latitude we have only to find our longitude, and the point of intersection of the two lines shows the location of the ship on the chart.

The lines of longitude run north and south and therefore at right angles to the equator, and starting north and south from the equator, converge and meet at the poles. These lines of longitude are numbered and counted east and west from Greenwich (England).

The longitude of New York (according to our Standard time) is 75 degrees west (from Greenwich) and, as we all know, the difference in time between England and New York is five hours; i. e., at noon in England it is 7 a. m. in New York. To find the longitude at any intermediate point we need a chronometer giving the exact Greenwich time and a sextant with which to ascertain the exact local time at the point of observation. For example, if with our sextant we take an observation of the sun from New York and find the local time to be 7 a. m and at the instant of the observation the Greenwich chronometer shows exactly noon, we find the difference of time to be five hours. Now, as we know that for every hour's difference in time there are 15 degrees difference in longitude (or arc) we simply multiply the 15 degrees by 5, which gives us 75 degrees as the longitude at the point of observation. As a further illustration let us assume a ship to be located in mid-ocean. By a chronometer sight of the sun we calculate the local time on board the ship to be 9:30 a. m., and at the exact instant of observation the Greenwich chronometer shows exactly noon. Thus we find a difference in time of 2½ hours, and as we know that for each hour there is a difference of 15 degrees in longitude, we multiply $15 \times 2\frac{1}{2}$ and get 37½ degrees (37° 30′) as the longitude of the ship at the time of observation. But how do we know whether our longitude is east or west from Greenwich? Of course, on the North Atlantic the longitude is always west. But I have taken many observations on the Mediterranean, where we find both east and west longitude, and I have always been guided by the old Sailor's adage:

"Greenwich time best,
Longitude west;
Greenwich time least,
Longitude east."

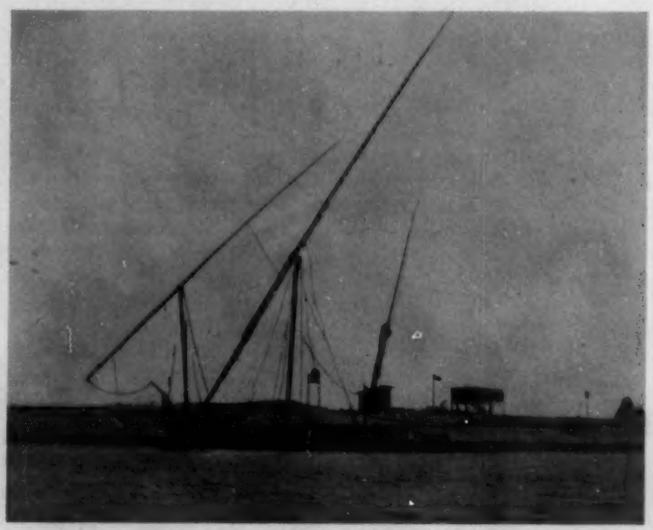
In the foregoing illustration Greenwich time was "best," and therefore the longitude, 37° 30′, was west.

The reader will naturally ask, "How do you ascertain the local time on board ship by an observation of the sun?" An explanation of this calculation would require space beyond the limitations of this article. Suffice it to say that the navigator is able to ascertain the local time on board ship by the use of his

sextant, and by noting at the same instant the Greenwich time by the chronometer and converting the difference of time into arc, the longitude is found. The most accurate time for making these observations for longitude is when the sun is nearly half-way up or a little more than half-way down; or from 7:30 to 9 a. m. or from 3 to 4 p. m.

Having explained briefly the principal methods employed in deep sea navigation, I will now refer to the practical daily routine as I have found it on board a first-class modern passenger steamship bound from New York to a British or neighboring continental port.

It is an almost universal rule that every observation and calculation made by the captain shall be checked by one or more officers; but, unfortunately this rule, which ought to become an international law, is not always adhered to, and disaster frequently results. In all my experience in crossing the Atlantic, however, I have never been on a ship where it was not rigidly enforced. I am summoned (usually to the lower bridge) at about 7:30 a. m. There I find the captain and two or three officers with their sextants ready to take the first morning observation for longitude. I, too, with my own sextant take a sight of the sun. An officer stands over the chronometer (usually in the chart room) and as each observer calls out "stop" or "time" the man at the chronometer notes the exact Greenwich time. The observer then notes with a pencil on a pad the altitude (or angle) of the sun and the Greenwich time as given by the chronometer, goes to his room, calculates the longitude as hereinbefore explained and reports the result to the captain. The captain compares these reports from the various observers and if they agree substantially he enters the longitude in the log. Formerly, on the slower ships, the usual margin of error or difference allowed, as between officers, was about two miles in calculating longitude on easterly or westerly courses; but on some of the fastest modern "flyers" I have known as much as five miles difference to be accepted by the captain as sufficiently accurate for all practical purposes.



FELUCCAS MOORED IN THE MOUTH OF THE SUEZ CANAL, AT PORT SAID—THIS IS THE COMMON ORIENTAL RIG.

In my own experience I have generally used a very fine and expensive sextant made by the famous instrument maker Gamba, of Paris. This instrument I prize very highly, as it was given to me by Commodore Horatio Mackay when he retired from active service in the Cunard Line after a highly honorable and brilliant career extending over a period of forty-five years or more. With the use of this instrument, which is designed for fine work in surveying on land and is more delicate and accurate than is necessary in practical work at sea, and by extending the decimal numbers of my "logarithms" further than is usual, my calculations have been very accurate and, nine times out of ten, have come well within the margin of error allowed by the captain.

In these observations for longitude I have found that it is a common and a very commendable practice to take three sights in quick succession, work them out and take the mean. This method insures greater accuracy.

At about fifteen minutes before noon we all assemble on the bridge and when the sun has reached the zenith we get the altitude (or angle), retire to our respective rooms, calculate the latitude, as I have explained, and report again to the captain. In this report we also estimate the longitude and call it "Longitude by Dead Reckoning." To estimate this we take the longitude found by the morning observation, estimate the distance run since that time and so find the approximate longitude at noon.

All having practically agreed, the captain fills out a blank bulletin, giving the position or latitude and longitude of the ship at noon and the distance run during the preceding twenty-four hours. If all the calculations are the result of actual observations this bulletin is marked "By obv." If, however, there has been a fog or the sun has been obscured by clouds, the position and distance run are estimated by "Dead Reckoning," and the bulletin is accordingly marked "By D. R."

This problem of "Dead Reckoning" is a most interesting one, and I have been greatly impressed with its accuracy. In steering, two or more compasses are used, in order to secure greater accuracy. In easterly and westerly courses the latitude is easily determined by a line drawn with pencil and ruler on the chart, taking any given point of departure and laying out the compass course. Hence, estimating the latitude correctly depends upon the accuracy of the compasses. Longitude on easterly and westerly courses must, of course, be calculated by estimated distance run, east or west.

This distance was formerly estimated by the common taffrail log, but I have been told by a well-known transatlantic captain that nearly all of these "patent logs" failed as soon as the speed of ships exceeded 20 knots per hour.

The method now most generally adopted is to estimate distance run by counting and recording the revolutions of the propellor wheels. By the angle of the blades, "pitch," as it is called, it is a simple mathematical problem to calculate the distance traveled, assuming that the screw were turning in a solid material; but in the water there is a loss which is called "slip," which is measured and expressed in percentages. Thus, if the pitch of a screw is so designed as to travel 10 miles with a given number of revolutions, that would be called "theoretical" distance traveled. If the actual distance through the water with the same number of revolutions should be 9 miles, the loss of 1 mile would show the slip to be 10 per cent.

On board the Lucania, for example, every day at a few minutes past noon a card was sent up from the engine room to the bridge printed as follows:

S. S. LUCANIA.

Report for day ending.....190 .
Revolutions starboard engines.....
Revolutions port engines.....
Mean (or average) revolutions.....
Theoretical distance ..... miles.

Here the engineer stops; and if the officers have ascertained the

exact distance by actual observations, the following entry (for example) is made in the log:

	Miles.
Distance by engine revolutions.....	500
Actual distance run.....	450
Actual slip	50

Being 10 per cent.

At the same time the captain enters in the log the conditions of weather and sea, the direction and velocity of winds, etc., so that when we come to a day when the sun is obscured by fog or clouds we turn back through the log to a day of similar weather conditions, and by applying that day's percentage of slip to the theoretical distance given by the engine room's report, we estimate with great accuracy the run of the preceding twenty-four hours. This distance, East or West, tracked out on the chart, gives the longitude; and having previously estimated the latitude by the compass course, as hereinbefore explained, the location of the ship and the distance run are posted as "dead reckoning."

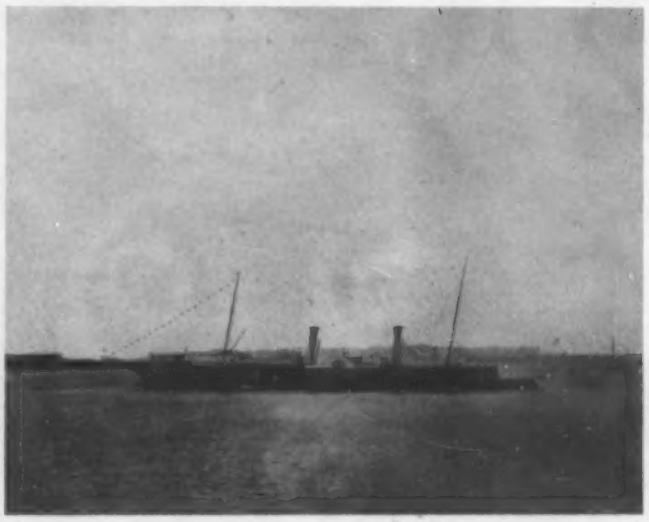
The next regular work, along about three or four o'clock in the afternoon, is to take further "chronometer sights" of the sun for longitude. The actual distance run from noon is then compared with the revolutions of the engines, and a further tally between engine room and bridge calculations is made. Then at night, generally about eight o'clock, if "Polaris" (the Pole star) is visible, with a clear horizon, an observation is made with a sextant to determine the latitude, and so determine the accuracy of the compass course sailed since noon.

Going back to the noon observation, the captain himself, immediately after the location of the ship has been determined, decides the exact position he wants to be in the next day, and sends the officers to their rooms to calculate what the compass course should be. If they all agree, the course to be steered is posted in large, plain figures where the quartermaster (who stands at the wheel) cannot fail to see it. By this method there can be no misunderstanding of orders given orally. It is always the duty of the officer of the deck to read the compass at frequent intervals in order to be sure that the quartermaster is steering the right course.

If a good observation of Polaris is obtained in the evening and the latitude thus computed is slightly off the compass course given at noon, a new course is calculated to correct the observed error.

I have so far described only the principal and usual work done at sea. It is customary, however, on nearly all steamers for some of the navigating officers to take observations of any of the fixed stars, such as Saturn, Jupiter, Arcturus, Sirius, Regulus, Pollux, Vega, etc., whenever they are visible at night. The deductions from these stellar observations are not as accurate as observations of the sun, and are therefore not relied upon with the same degree of certainty. They are principally useful as a guide after days when the sun has been obscured and may be used for the purpose of checking dead reckoning.

In the foregoing narrative I have tried to give a comprehensive and intelligible account of the usual work at sea, in all of which I have participated. I have been much gratified by the courteous and cordial treatment which I have always received from skippers and navigating officers alike. Indeed, I have been frequently told that the fact that I was engaged as a sort of assistant navigator greatly relieved the skipper and other officers from the voluminous and absurd questions constantly fired at them by ignorant passengers. I am reminded of an amusing incident that occurred one day on the old Furst Bismarck while running along the coast of Greece, where the mountains rise up 10,000 feet straight out of the sea, and the tops are white with snow, in contrast with the rugged black rocks and the unimitable



KHEDIVE'S YACHT ANCHORED IN ALEXANDRIA HARBOR.

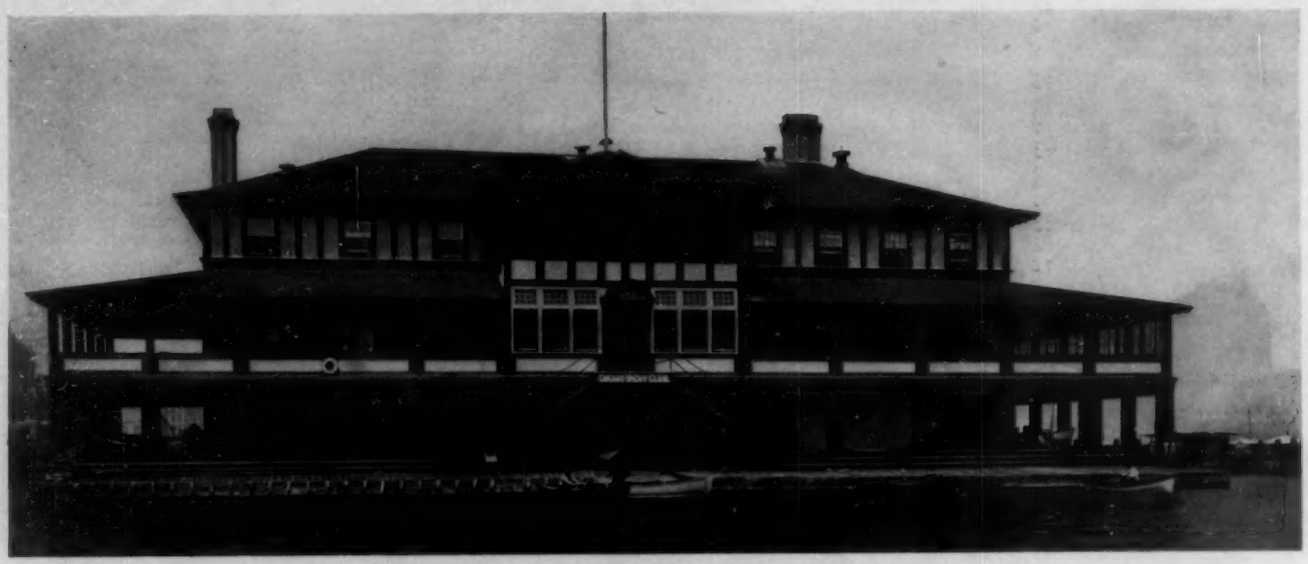
color of the Mediterranean sparkling in the gorgeous sunlight. An old lady passenger addressed Captain Albers, and, pointing at the coast, asked, "What is that, Captain Albers?" The captain replied, "That is Greece, Madam." The old lady walked away satisfied, but exclaiming, "Oh, some of the passengers thought it was snow."

On another occasion, on a German steamer, we had just come in sight of the Scilly Islands, approaching the Southern coast of England, bound for Plymouth. An irrepressible Yankee, who had plied me with innumerable questions during the entire passage, approached me and pointing to Bishop's Rock, asked, "What is that?" I replied, rather curtly, "Scilly." He exclaimed, "Oh! then that must be Charybdis on the other side." Tired of being questioned, and anxious to avoid argument, I nodded assent, whereupon he went to his companions in the smoking room and informed them that we were passing Scilla and Charybdis.

While it may not be germane to my subject, I may be pardoned for the departure by relating another amusing incident,

(Continued on page 252.)

QUARTER DECK OF THE DIAHLIAH, BELONGING TO COUNT D'ASPRAMONTE, OF THE ITALIAN LEGATION, ANCHORED IN THE NILE, AT CAIRO, EGYPT.



THE HOME OF THE CHICAGO YACHT CLUB.

Successful American Yacht Clubs—III.

The Chicago Yacht Club

ORGANIZED THIRTY-ONE YEARS AGO AT THE SHERMAN HOUSE, THE CLUB PASSED THROUGH STORMY SEAS THAT WOULD HAVE WRECKED AN ORGANIZATION LESS STAUNCH—NOW, HOWEVER, IN POINT OF MEMBERSHIP, POWER AND AUTHORITY, IT IS THE LEADING SPIRIT IN GREAT LAKE YACHTING

By J. M. HANDLEY

THIRTY-ONE years ago last August Mr. Charles E. Kremer, a young attorney and enthusiastic yachtsman, called a meeting at the Sherman House of Chicago, to which thirty-seven devoted sailors responded. Then and there was born the Chicago Yacht Club. Last September Mr. Kremer, still leader on the roll of this organization, presided at a dinner of the "First Hundred," an organization of the club. Of the original thirty-seven who had enrolled themselves for the sport of yachting in the Sherman House when Chicago was just beginning to recover from its great fire, he was the only one at that reunion.

The vicissitudes of the Chicago Yacht Club have been enough to wreck the hopes of any body of amateur sailors, but it has risen superior to all difficulties until to-day its waiting list is so long that the suggestion to increase the membership is made annually.

When at the conclusion of that meeting at the Sherman House in 1875 the club had been reorganized, with Mr. John Prindiville as commodore, Mr. T. M. Bradley as vice-commodore, Mr. W. F. Higgie as rear-commodore, and Mr. Kremer as secretary, steps were taken at once to arrange a regatta. Saturday, Aug. 24, was set as the date for the occasion, and answering the call nine yachts came to the starting line on the lake. They were Frolic, Anna L. Carey, Zephyr, Fleetwing, Dawn, Lucy, Lincoln, Lulu and Naiad.

In 1876 the fleet was increased to twelve boats, and two more were added the following year, while the membership grew apace. Secretary Kremer issued the first year book of the club in 1877, a copy of which is still one of his well-guarded treasures, while his book of accounts of the organization, a volume not 3 inches wide and perhaps 5 inches long containing 100 pages, represents all the bookkeeping of the first half-dozen years of the club's life.

The year book contained the first sailing rules adopted in the West, and, compared to the complicated and lengthy compilations of to-day, they are short, frank and to the point. In those days yachtsmen sailed more for the sport and glory of the game and less for cup-grabbing.

One of the early rulings incorporated in the by-laws was regarding the proper costume or uniform for members to wear. That it was an impressive and decorative scheme cannot be denied, and it lacked only the top hats which they used to wear around New York on sailing expeditions to add to its discomfort. I quote verbatim from the first year book:

"Frock coat of navy blue cloth with two rows of large size yacht club buttons on the breast, nine in each row; four buttons, two on top and two on bottom of the skirts behind. Pantaloons of navy blue cloth or white drill and vest of navy blue cloth or white drill, single breasted with standing collar to button nearly to the throat with eight small Chicago Yacht Club buttons and neckerchief of black silk."

The cap worn with this costume was the same as that worn in the navy at that period, with small, round crown and straight brim. There is also elaborate provision made for shoulder straps and cap ornaments in these by-laws.

By 1880 the club was able to secure small quarters on Michigan Avenue. Across the boulevard was a broad dumping ground, which the city has since converted into a park. Beyond

that and the Illnois Central tracks, which at that time were elevated on piles over the waters of the basin, was the lake front, with a dock at which landings could be made and where sail boats for hire were to be had. Here the club had its landing wharf and here it anchored its fleet in the basin formed by the building of the government pier.

As the club grew the fleet increased until, in 1882, it included the three largest schooner yachts that had ever been sailed on the lake; Countess of Dufferin, Idler and Viking, together with a dozen and a half smaller boats. The Countess, as she was called for short, was the Canadian challenger for the America Cup, and was brought to Chicago by Rear-Commodore Griggs.

After 1882, interest dwindled and dwindled, hard times beset the West and the club fell into a condition of desuetude. The charter which had been secured from the State was kept up, however, and ten years later an attempt was made to bring the club out of its sloth. It was suggested then to hand over the charter to the Chicago Athletic Association and to combine the two organizations, but this plan was voted down by the athletic governors and again interest waned. Meanwhile the Columbia Yacht Club had come to life, and the old sailing crowd foregathered in the scow at the foot of Randolph Street that had been fitted up as a clubhouse. Here the activities centered for a while, but a movement was instituted by a few of the malcontents in the Columbia ranks

THE CLUB LIBRARY, WHERE ROCKING CHAIR AND REAL SAILORS JOIN WHEN WINTER CLOSES LAKE NAVIGATION.

to revive the older organization. Commodore Paulsen, who was then in possesson of the old charter, turned it over to them, and at an election held in 1897 Mr. F. W. Morgan was elected commodore, Mr. F. K. Bull, vice-commodore, and Mr. Charles H. Thorne, secretary and treasurer. Sixty members were enrolled on the roster and they began club life anew in the Argo Boat Club house on the Illinois Central pier. The following year they challenged for the Canada Cup, which had been won by Canada from Vencedor, a Chicago boat, and announced that the trial races the following year would be open to all clubs on the great lakes.

To defray the expenses of the trials the sixty members raised a purse of $1,500. Five boats were built at Chicago for the race, and Rochester sent the famous Genesee to contest for the honor of winning back the cup from the Canadians. How Genesee defeated Prairie, Josephine, Bald Eagle, Briar and Viva made yachting history for weeks. The winning boat went to Toronto and was accompanied by Commodore Morgan's Pathfinder, still the handsomest steam yacht on the great lakes; by Rear-Commodore George Warrington's steam yacht Thistle, and by Mr. George R. Peare's Siren, a 52-foot racing length sloop, sister boat to the Vencedor and Vanenna. Of the sixty members of the club, over twenty made the trip to the Canadian city, a

A PLACE FOR BON VIVANTS AS WELL AS YACHTSMEN.

remarkable showing. They had plenty of cause to rejoice, for Genesee won the Canada Cup from Beaver, the Dominion defender, and it came back to Chicago in the lockers of Commodore Morgan's Pathfinder.

This series of races gave the new club the impetus it needed, and the membership list grew at a tremendous rate, especially after a challenge from the Royal Canadian Yacht Club for the trophy had been accepted. The old scow looked all too small by that time, and plans were matured for the erection of a new house capable of accommodating a membership of 500.

In 1901 the trial races for the selection of a defender to race against the Canadian boat Invader were held, and after a series of contests that were the most sensational ever seen in the West, the Detroit boat Cadillac was selected. The choosing of Cadillac was a sore disappointment to Lake Michigan men, who had pinned their faith on Mr. George M. Pynchon's beautiful boat Illinois, or on the freak "sidewalk" Milwaukee, which had proved itself a marvel in light airs. Invader carried off the cup, but the Chicago Yacht Club was established once more on a sound basis and plans for the new clubhouse were rushed.

That fall the foundation piles for the building were driven, but its completion was delayed by a series of injunction suits instituted by Mr. Montgomery Ward, the watch dog of the lake front, as he is known in Chicago. The battle was fought out at length in the courts, and after months of litigation the injunction was dissolved. The new house is a comfortable, artistic and wholesome type of building of the colonial period. It is 104 feet long and 42 feet wide, and is surrounded on the north, east and

THE RECEPTION ROOM.

west sides by 15-foot verandas. A 15-foot landing dock is also on the east side. The first floor, which is remarkable for its comfortable, restful design and low-toned coloring, is divided into a large reception room that leads from the entrance facing the lake front park that is to be, but which is still in the shape of a dumping ground for unsightly piles of mud, clay and broken debris from building operations. To the south of the reception hall, which is 28 by 33 feet in dimensions, is the living room, a big, cosy apartment, with a huge fireplace, many deep lounging chairs, plenty of reading material and a piano.

North of the reception room is the dining room, also fitted

A TYPICAL CHICAGO RACING YACHT, CHERRY CIRCLE, WINNER OF LIPTON CUP.

with a big fireplace, and large enough to seat the First Hundred Club at its annual banquet. The verandas around the dining room are enclosed in glass so that they can be made part of the dining room, and here is the most popular dining resort in Chicago in summer, for when it is hottest in the city the lake breezes always waft through the verandas and leave a refreshing sense of comfort over the sun-dried city men.

The interior, downstairs, is finished in smoked oak and the soft, subdued shades of green that are so restful to the eye. A feature of the club that elicits unusual interest is a series of yachting pictures in oils by Mr. W. B. Mundie, the club librarian, in which spirited drawing and tone execution are notable.

The second floor is devoted to a large billiard room, to the offices of the club and to sleeping apartments for the resident members, of which there are twelve, and the servants' quarters. The basement is fitted with locker rooms, dressing rooms, retiring rooms for the men and storage rooms for spars, canvas, dinghies and dunnage, and to a dining room for the employees of the club and of members. The kitchen is behind the dining room on the main floor. The plan and arrangement are wholly admirable and, while it looks as though the club would hardly be large enough to take care of the increased membership that is bound to come with time, it is quite large enough for the present needs of its members, and during its open months, from the first of May to the end of October, it is the most popular and largely attended club in the city.

To-day the club has a fleet of eight steam yachts, seventeen motor boats, five big schooners and nearly fifty sloops, all owned by club members.

The organization's principal trophy is the Mackinac Cup, which is sailed for annually over the Chicago-Mackinac Island course of over 331 miles. The latter part of the race is over a most arduous and exacting course, where seamanship and pluck count as high as speed of vessel. It was won for the first time last year by Rear-Commodore George R. Steere's Vanadis, an auxiliary yawl designed and built by W. J. Starr, of Eau Claire, Wis. The Mackinac Cup promises to become the most coveted trophy on the great lakes, as the race is the "sportiest" event scheduled on the fresh water. In addition to the Mackinac Cup the Chicago Yacht Club has a permanent trophy in the Sir John Nutting Cup, offered by the Irish baronet for the restricted 18-foot cruiser class of the Chicago Yacht Club. This year there will be four new boats built to fight for this cup, and with the three now afloat the race promises much.

During the past year a spirit of neighborly friendliness, which for some seasons had been lacking, has been steadily growing between the Chicago Yacht Club and its rival organization, the Columbia Yacht Club. The breach which for years seemed unbridgeable has been slowly but surely narrowed down, and the good-fellowship of another season may close it entirely. This much-desired condition of friendliness has been brought about largely by the good offices of Commodore William L. Baum, the present executive head of the Chicago Yacht Club. His motto is "Let us be rivals, but let us be good pals for all that." The good spirit has had its reward, and at a smoker held at the Chicago Yacht Club last summer, to which the Columbia Yacht Club members were invited in a body, the feeling of animosity was buried under a flood of good fellowship. When, later, a serious row threatened to break up the Lipton Cup races of the Columbia Yacht Club and spoil one of the most important yachting events on the great lakes, it was the suave tact and conciliating methods of Commodore Baum that spread harmony, like oil, on the turbulent waters, and brought about a peaceful agreement of the differences. It was at Commodore Baum's instance that the Mackinac race was opened to the yacht clubs on the great lakes in order that the rival club might send its fleet of fast cruisers into the competition, and it was Commodore Baum who urged the building of a 21-foot cabin class boat by a syndicate of Chicago Yacht Club members to compete for the Lipton Cup next season. Commodore Shaw, of the Columbia, has helped the good work along. He has been the sponsor of a syndicate to build a boat to compete in the restricted 18-foot class for the Sir John Nutting Cup of the Chicago Yacht Club, and at the last monthly meeting of his organization he proposed that the big annual cruising race of the Columbia Yacht Club should be made an open race in future in order that the Chicago Yacht Club boats might sail in it. These exhibitions of genuine friendliness and true rivalry will do much to build up interest in the sport in the West and promote it on Lake Michigan.

The Edna's Last Run

By T. JENKINS HAINS

CHAPTER IV.—Continued.

ELMER was duly appointed as cook for the occasion, and, as he had good references—from his mother—we allowed him to begin duty at once. Rice was the one thing we always kept on board for emergencies, for from it could be made puddings and many unusual dishes. Elmer had never cooked it, but knew it must be boiled to start with. Taking a full quart of the grain, he placed it in a saucepan and covered it with water, putting it on the galley stove to boil. Soon the swelling grains filled the pot entirely. He placed a lid upon them to hold them down, but as the water grew hotter and hotter they swelled more and more. When we went below, in answer to his cries of distress, we found him holding onto the cover, vainly trying to keep the white mass within bounds, while the top of the stove and the galley floor looked as though struck by a snowstorm. Mrs. H. finally consented to cook the entire dinner.

In the early afternoon we put the mainsail on Edna and hove her short to the mooring, ready to cast off on either tack at a moment's notice. Elmer soon heard a hail and started in for the guests. In a little while he returned.

"What's the matter?" I asked, noting the empty boat.

"Say, Cap., there's a feller wid hair a fut long wantin' to come out wid me. I told him 'nix' till he paid de barber. He wuz one o' dem guys wot writes potry, I reckon," said Elmer.

"You eternal idiot, go right back and bring him aboard—don't you know that he is our guest—the great writer?" I cried.

"Ah, Cap., you don't mean nothin' like dat, sure?" and he looked up at me with the question in his eyes.

I sprang into the small boat and ordered Elmer to pull for the landing with all speed. He did so, but kept looking at me askance. The author of "Greater Life" stood serenely upon the float at the yacht club landing. His hair seemed greatly out of place near the salt water, and his delicate, refined features reflected the glory of the student's den. Yet he was a man of parts in spite of his appearance. He shook hands warmly and sprang aboard, just as the slender form of the great editor came down the slip. The look of horror and amazement was plain in the editorial eyes, but there was no time for parley.

"Get aboard, quick," I said; "the sea is rough here, and you will get all wet with the boat pounding against the float," and he sprang in also. We rowed to Edna in silence. Without delay we broke clear and stood off for Oyster Bay. The day was beautiful, and the breeze just strong enough for sailing comfortably.

"The magazine business is very dull," ventured the editor as soon as possible; "we are having a tremendous boom on our circulation, but have so much magnificent material to use we have little editing to do."

"I'm glad to hear you say that," said the author; "the salvation of the human race is doubtless to be accomplished only through education—and education can only be general when popular. The amount of good material produced, however, astonishes me, for I have hard work to fill half my orders—had to turn down two of the leading periodicals last week."

The editor gave a little cough, and his eyebrows raised, but he said nothing directly in reply. Everything from a goose-neck to a Tom-fool's knot was shown the unnautical, and the beautiful palaces of the rich upon the north shore of Long Island were viewed and discussed. Elmer was busy below, getting dinner in shape to serve, and after a 10-mile run we anchored to appease the appetites which were now bordering upon the ferocious. It was a good dinner, and the furtive look gradually disappeared from the editorial eye as cigars and pipes were brought forth and we adjourned to the quarterdeck to smoke.

"It seems to me," said the author, reclining at full length in the sunlight, "that nearly all of the suffering and bad feeling in the world is caused by misunderstanding human nature. Ignorance and prejudice against some already half-fixed idea causes much ill-will and does much harm." He was looking out of the clew of his eye at the editor as he spoke—and the editor knew it.

"Every criminal brought to justice has the same argument—misunderstood genius," observed the editor in reply. He was gazing over the sparkling Sound, where a large yacht was standing along for Newport, but he was still alert and mindful of his natural enemy.

"In many cases the criminal tells the truth," said the author simply. "We are all more or less criminal—only fools are perfect; but this sunshine puts me in mind of a yacht I once knew—spent a week aboard her, in fact, before she went on her last cruise. She was fitted elegantly—" For an hour he held forth. He told a good yarn, and we appreciated it.

It was now almost dark. The sun was sinking behind the Connecticut hills, and Mrs. H. went below for her coat, for the breeze was cool. The editor was still looking across the Sound, and his eyes were dreamy, while the author now smoked on in silence.

Suddenly the editor started up.

"I must go now," he said; "I'll just have time to catch the evening train back to town. Elmer can row me ashore to the landing. I certainly have enjoyed the day very much."

In a few minutes his back was toward us, his shoulders rising above the stern-sheets of the small boat, as Elmer pointed her head for the beach and rowed with a will, which was inspired by a tip. He had no energy for "cheap people," as he termed many of our friends who forgot this little detail. The darkness came on apace, and the light of the author's cigar made the one bright spot in the gloom. I came to where he sat and drew forth the sailor's pipe, cutting a piece of plug tobacco and rolling the chips in my hands.

"I have enjoyed the day hugely," said he, "and you must forgive me for having used your handsome craft as a vehicle of trade—I rather think I sold our friend a story, don't you?" and as he looked up there was just a suspicion of a twinkle in his eyes.

CHAPTER V.

After spending several days in New Rochelle enjoying ourselves, taking out many friends for sails upon the Sound, we realized that it was nearly time to get ready for the Southern cruise. There had been several inducements offered for the voyage South, among them a demand for Bahama Bank stories and literature concerning the Florida Reef. On the sixteenth day of September we lay at the anchorage and the glass began to fall. It was a very heavy, humid atmosphere during the night, and several times I arose and went on deck to look around. The wind was brisk from the southward, and during the night a clam-digger sloop anchored close by us. At daylight the heaviness of the damp air was oppressive, the glass still going down rapidly. At six in the morning the clam-digger got under way and stood in behind the point, making a snug harbor. The dozen or more yachts lay at their moorings, and their crews started to wash down decks and put gear in order, as usual. A long, heavy bank rose in the southeast, and the scud started flying overhead at a rapid rate, taking a diagonal course across the smooth stretch of dun-colored vapor which rose upon the southern sky. It looked bad, and I found that we were too close to a boat which had no

one aboard, Carrie, of New York. It was necessary to get away, and I called Elmer to help weigh anchor, both of us heaving in the cable on the windlass. We were forced to let go again astern of the Carrie, quite close to her, in about two fathoms of water. As we were drawing 7 feet, it was close enough. Getting out the great starboard anchor—an anchor weighing 400 pounds, and having 5 feet of heavy metal in the shank—I let go and gave all the scope possible, ranging to about fifteen fathoms of heavy chain. Elmer went below. It started in to breeze up rapidly. By nine o'clock it was blowing hard, and the sky was a great pall, while close beneath it went the scud, whirling away at a rate which told of something coming. Then followed heavy squalls, which struck with great force and howled through the rigging, straining out the cable, and seeming to almost pick up the little craft bodily. The sea grew rapidly. It came with a rush, and we received the whole force of it. The squalls grew in violence until it was impossible to stand on deck. I was forced to lie down, and did so, with my nose below the rail and my eyes above it, watching the chain, which stretched like a rod of iron straight out clear of the sea for 50 feet. I gave her more chain and put a hemp stopper outside the bitts to ease the smash when she rose to it, for at each plunge she brought up solidly. Going below for a sou'wester, I chanced to look out through a bull's-eye. A handsome yacht was dragging her moorings and was fast approaching the rocks, upon which the sea fell in a cloud of spray. Struck by a tremendous squall, she went astern into the breakers, and in a moment was lost to sight in the smother.

AFTER THE STORM—THE WORK OF A SOUND GALE.

Suddenly another yacht, a little farther away, started in. Her jib, torn out of the gaskets by the furious rush of the hurricane, broke out and raised upon the stay. Then filling, it tore to ribbons, swinging her head off and parting her cable. She went in close to the first one and in a moment was a mass of splinters.

While we looked, I noticed that we were dragging a little. The sea was now wild, rushing in tremendous combers upon the rocks. A sudden jar below nearly knocked me off my feet. I tossed the lead line over and noticed the two-fathom mark just above the surface. It began to lead forward, showing that we were going in. Calling to Elmer, I crawled along the deck and instantly let go the small anchor, giving all the cable I could, hoping that it might help to check us. But squall after squall came down upon us with increased fury. It was blowing a full hurricane now, 65 miles an hour between the squalls, and probably twice that in them. While I tried to look ahead to see if the chain was still holding, I saw the small anchor cable tauten out, and knew we were holding on to both for all they were worth. A white sloop came past, drifting with the gale, and a voice of a sailor called faintly. The vessel was almost upon us, but grazed past, her bowsprit just touching our rigging. A man stood at her mast and bawled something, but the wind was too hard, no sound could be heard above the roar save a faint screech. In a moment the sloop was astern of us and upon the beach. Looking to the eastward again, we saw a small knockabout break away and strike upon a ledge, sinking while her captain climbed for his life up the mast, which stood out clear of the sea. The yawl Scoffer, a new boat, was dragging her mooring abreast of us, although she was reinforced by three anchors. Five men were seen struggling upon her forecastle head, and she finally stopped, her forefoot thrown high in the air by each sea until we could see half way under her bottom at each plunge. She whipped her jigger mast out and tore up the after deck with the tremendous jumping, but she was saved.

While we looked we started in again—very slowly, but we had only a short distance to go; for we were striking at every plunge and the tide was falling. I went below.

"Looks as if we will all have to go in," I said; "nothing seems able to stand this strain. It is blowing harder and harder—I reckon we can make a landing all right through the surf." My wife looked at me anxiously. The motion was tremendous below, and we were forced to hold on with both hands. Astern of us now lay five handsome craft, or rather what was left of them, everything having gone in to windward of us being exposed to the sweep of the outside sea. Only the vessels which were farthest east still held on.

But the great anchor gave slowly. The smaller one, with a 5-inch hawser, had gone. Edna swung her head off and a tremendous sea struck her. It burst over her masthead, and we three in the cock-pit, partly sheltered by the cabin trunk, were submerged and almost drowned. Another sea struck her and burst into a whirlwind of spray. We were hurled to leeward, but managed to stay aboard. Then Edna swung broadside-to in the surf, and, the small boat which I had towing astern still being afloat, I saw a chance.

Hauling in the painter, I managed to get Elmer into her with a bucket to bail. He took one dip and then the sea swept the small craft to leeward, where she brought up like the crack of a whip, getting ten times as much water in her as he had taken out. The poor lad was almost thrown out and lost. Seeing that he could not live aboard her, it now became evident that I must get him back, and, knowing that if I got aboard myself and went adrift my wife and he would both be lost, I gave up the idea and hauled in the line. Becoming frightened at the imminent prospect of drowning, Elmer rose in the boat. To remain in her without holding on to her gunwales with both hands being certain to cause his death, I bawled for him to crouch down and wait until I could rescue him. But the roar of the storm was too loud. I hauled the line rapidly and managed to reach over and grip his collar when the sea tore her away again to leeward. Dragging him to the deck, I had no chance to slack off the line, and my finger was caught in the cleat and the bone splintered.

Seeing that the sea would now break over her stern, I managed to get all hands below, and locked and bolted the cabin doors to keep the heavy water out. Then Edna pounded her way into shallow water, the seas breaking over her clear, but without danger to those below. In an hour she had parted the anchor chain and was inside the heavy surf, and lay upon her bilge, her bowsprit almost to the wrecks of four vessels which had had the misfortune to go in ahead of her, and which formed a buffer or fender between her and the ledge.

After she had driven up so high the seas no longer broke over her solidly, my wife came on deck, and we could leave the cabin doors open again without danger of her filling. She still pounded forward, but her iron keel caught fast in about 5 feet of water, was driven nearly 2 feet into the hard bottom. In a little while the squalls began to moderate. Men were seen coming along the shore. The poor fellow clinging to the masthead of the little knockabout was rescued in an exhausted condition. The last yacht which had gone in ahead of us was high and dry on the beach in a little cove, and perfectly safe. Her captain tried to get to us in his small boat, but, owing to the heavy sea, was obliged to finally give it up and get ashore. Soon forms began to show upon the bluff. A party of men in bathing suits and old clothes came down to the shore. I took the large circular life-buoy and made fast to it a long line. Then I hove it as far as possible toward the beach. The surf was boiling between Edna and the wrecks, and the undertow threw it back constantly, in spite of all my efforts. Finally a heavily-built fellow, a fine sailor and captain of a yacht, dashed into the sea, and, by dint of swimming upon the lift of the waves and struggling when shallow enough to get his feet upon the bottom, managed to get hold of the buoy and get ashore with it. They made it fast to the mast of one of the wrecks, and in a few minutes we had a proper life-line rigged between us and the shore. Six men came out to us and climbed aboard.

(Continued on page 248.)

READY FOR A SPURT—THE NEW AND THE OLD.

CARRYING THE SCOOTER TO THE ICE.

The Motor Scooter

By OWEN ROBERTS

LONG ISLAND inventors have achieved many interesting results in the way of boats in the past years, but nothing ever evolved in this section of the country excited such interest as that aroused by the appearance of Mr. Nat Roe's motor scooter on Great South Bay this winter.

In her first week on the bay, under conditions not especially good, Mr. Roe's scooter made over a mile a minute. The regular sail scooters going in a good breeze were allowed to make half way to Blue Point and then were picked up by the new craft. She is just an ordinary 14-foot scooter, with sharp bow and a half-rounded stern, fitted with a high-speed motor, is just under 5 feet in width, and is of the same depth of hold as the sail scooters.

The motor is installed in front of the cockpit. It is a remarkable engine, weighing only 150 pounds with balance wheel. It formerly furnished the motive power for a flying machine which was abandoned at Ogdensburg, N. Y., where Mr. Roe secured it. It is of 20 hp, and has a speed of 2500 revolutions per minute, which makes 5000 explosions a minute on high speed, sounding like a battery of rapid-fire guns in action. It has ball bearings, and is mounted on rubber cushions to minimize the jar. The driving mechanism is a 28-inch wheel fitted with chisel-point teeth on the rim, which catch in the ice and drive the boat along. This wheel is geared to 800 revolutions per minute, which insures a speed of 70 miles an hour. With good ice, it is claimed that the novel machine can make 100 miles an hour.

UNDER WAY.

The steering outfit is a combination of automobile and ice boat gear. There is a strip of steel about 5 feet long and a half inch wide with a running service to the ice of about 14 inches, set half-way between the stern and the center of the craft, which serves as a rudder. This rudder is operated by a small wheel, the same as used on sailing craft, and fitted with a wire cable, which runs around the outside edges and is attached to the front end of the blade.

Power Boating in Casco Bay, Maine

ONE MAY CRUISE FOR A FORTNIGHT, MAKING A DIFFERENT HARBOR EACH DAY, WITHOUT GETTING INTO THE OPEN OCEAN — PROSPEROUS YACHT CLUBS AT PORTLAND AND ELSEWHERE ALONG THE SHORES OF THE BAY—FISHERMEN WERE THE FIRST TO EQUIP THEIR BOATS WITH GASOLENE ENGINES—SOMETHING ABOUT THE SPEED BOATS AND THE MORE COMFORTABLE CRAFT

By A. O. ELDEN

IF one takes a chart of Casco Bay, Maine, and measures an imaginary line drawn from the outermost point of Cape Elizabeth to Cape Small Point, near the mouth of the Kennebec River, the distance will be found to be something over 20 miles. Everything inside this imaginary line is commonly recognized as Casco Bay, and further careful study of the chart will show that the residents of this locality have much to justify their contention that they have the finest waters for yachting on the New England coast.

In a folder issued several years ago, this charming body of water was advertised as containing 365 islands, one for each day of the year. While it is likely that a few rocks or ledges covered at high water might have to be counted to obtain this total, the fact remains that there are, indeed, countless islands, which do render Casco Bay the ideal cruising ground for yachtsmen.

The particular charm of the bay for power boat sailors is that its possibilities as a protected or inside cruising ground are practically unlimited. One may cruise for a fortnight, making a different harbor every night, without once getting out into what we may term the open ocean. This naturally makes it a safe body of water for the amateur yachtsman, for, while there are frequently rough water and sudden weather changes, always characteristic of salt water boating, the many islands and mainland harbors make it nearly always possible for a skipper to reach a lee before the conditions become dangerous.

At Portland there are two prosperous yacht clubs. The old-established Portland Yacht Club was founded a good many years ago, before power boats were thought of, and is one of the largest and best known yachting organizations in the Eastern district. While its fleet is made up chiefly of sailing craft and steam yachts, there are now many gasolene motor-propelled yachts, as well as auxiliary sailing boats. The Portland Power Boat Association is a newer organization, having been in existence but two years; but it has a large and rapidly growing membership, a large fleet of motor-driven craft, and a modern and convenient club house located on the next wharf to that occupied by the Portland Yacht Club, which makes it possible for the two clubs to work pleasantly together in harmony. Not a few of the Portland yachtsmen belong to both.

It is difficult to estimate just how many motor boats there are in Casco Bay, but one statistician, after a careful investigation, has stated that there cannot be less than 1000 when the summer season is at its height. The fishermen were really responsible for the introduction of the gasolene motor here. The typical fishing boat of this locality is the Hampton, and the so-called mosquito fleet is made up almost wholly of these craft. They vary in length from 18 to 26 feet, the average boat being about 23 or 24 feet, with a beam of from 8 to 9 feet. The bow is high, and there is a pronounced sheer from stem to stern. Although the Hamptons were designed for sail power, they have proved admirably adapted to motors, and while their generous beam cuts down the speed, the majority of them, fitted with four-horse motors, will easily make 8 miles an hour and keep it up through any kind of a sea.

Six or seven years ago, when the first fisherman fitted his boat with a motor, his companions laughed at him and said it was not practical, the engine would never work when wanted, and other discouraging criticisms. For a while it seemed as if pessimistic predictions were to be verified, for sometimes the motor would and other times it would not run. But it was not long before its owner began to get the hang of the thing, to learn something about the peculiarities and obstinacies of a gasolene engine, and then he could laugh at his associates. While they rose at 3 A. M. in order to reach the fishing grounds, five or six miles off shore, in

THE HOME OF THE CASCO BAY YACHT CLUB.

THE PORTLAND POWER BOAT ASSOCIATION CLUB HOUSE.

GOINSUM II., CHAMPION RACER OF CASCO BAY.

A 30-FOOT CABIN CRUISER BUILT LAST SEASON FOR WILLIAM LEIGHTON.

order to get their trawls at daybreak, the motor boat skipper started an hour or so later, and even then was first on the grounds. But it was after the catch was made that he got in his fine work. While his companions labored frequently against an ebb tide and a light head wind, which prevented their reaching Portland and the market until one or two o'clock in the afternoon, the motor skipper started his engine and was tied up to the wharf, discharging his catch, an hour later. Naturally, he was the one who got the best prices for his fish.

The new England fisherman may not be particularly at home when it comes to a discussion of the literary ability of the standard authors or the merits of a rare painting, but for native shrewdness he stands alone. As soon as he realized that a gasolene engine meant dollars and cents to him, it did not take him long to get in line. To-day the straight sail-driven Hampton is a curiosity. Some carry sails in case of an emergency, but they are seldom used, unless to help out and save gasolene bills when there is a fair wind.

The fishermen had not used motors long before the pleasure boatmen began to appreciate their good points, and now there is every conceivable type of power-driven craft in the bay. For the first two years most of the motors were installed in open launches, but the yachtsmen soon discovered that while these were all right in fair weather, they were very wet in anything more than an ordinary summer breeze. While there are, of course, dozens of open launches in these waters to-day, the typical motor propelled pleasure craft of Casco Bay is the sensible hunting cabin cruiser of from 25 to 40 feet in length. About every engine manufactured in New England and quite a few from the Western inland States are to be found in local bay boats. In Portland and in other parts of the State of Maine first-class gasolene engines are manufactured, and a few of them are rapidly acquiring much more than a local reputation. Not until last summer did any real speed boats appear in the bay. But when they did come the races on the Fourth of July and many impromptu scrimmages made local sailors drop helms and rub their eyes. The speed sensation of the season was Goinsum II., built, owned and operated by Mr. E. P. Merrill, of Falmouth Foreside. This craft is of the freak type, of the simplest and cheapest construction, and is little more than a wedge in the water. One man sitting on the rail could bring her down until water poured in over the gunwales. But Goinsum II. proved to be in a class by herself, and nothing else got a "look-in" in any race she entered. The boat is 30 by 5 feet, draws 4 inches forward and 16 aft, and is fitted with a four-cylinder, 14-hp DeMooy motor. Her owner claims 23 miles for her, but no official record has ever been taken over a measured course. She was taken to Palm Beach this winter. Other fast boats in this vicinity, whose owners claim from 15 to 20 miles an hour speed, are the Emily & John, owned by Senator Oakley C. Curtis; Eleanor, owned by the Messrs. Randall; Philomena, owned by Hon. George F. West; Henrietta, owned by the Messrs. Schonland, and a few other lesser lights. The coming season will undoubtedly be a banner one in power boat circles.

HAMPTON FISHING BOAT WITH SAIL AND SAME KIND OF CRAFT FITTED WITH MOTOR.

A SENSIBLE 30-FOOT MOTOR BOAT DESIGNED, BUILT AND OWNED IN PORTLAND.

EMILY AND JOHN, OWNED BY O. C. CURTIS.

SCHOONER YACHT IDL

CHT IDLER ON THE WIND.

The Boat and Its Engine

THE POWER BOAT SCHEME SEEMS TO HAVE BEEN FIRST APPLIED BY COL. JOHN STEVENS, OF HOBOKEN, N. J.—HE HAD AN 18-FOOT OPEN CRAFT WITH STEAM ENGINE—THIS WAS IN 1804—NAPHTHA MOTOR IN 1835—THE ADVENT OF DAIMLER, WHO SHOULD HAVE A NICHE IN THE MECHANICAL HALL OF FAME—OLD GASOLENE ENGINES AND EVOLUTION OF IDEAS ON EVAPORATION—TWO CYCLES (STROKE) AND SOME FOUR-CYCLE ENGINES IN THIS COUNTRY IN THE 90'S—WHY AUTOMOBILE ENGINE IS NOT ADAPTED TO MARINE USE

By HOWARD GREENE

WHILE it is quite true that comparisons are sometimes odious, it is equally true, and of a good deal more importance, that the progress of development along a given line cannot be followed without making them. Therefore it will not be amiss to figuratively place the motor launch of to-day beside its steam-driven prototype of twelve or fifteen years ago and see wherein they differ.

In the first place, the old launch was constrained to use steam because there was no alternative power. The engine and boiler were heavy and high and, in a cabin boat, required a high superstructure to cover them, the result being a top-heavy craft unsafe in a heavy sea. The engine and boiler not only required a great deal of space, but demanded the best in the boat, and in addition to cramping the passengers, radiated heat and spread ashes, coal dust and sundry odors in all directions. Taking on coal, getting rid of ashes, firing up and cooling down, were all disagreeable processes in one way or another, and the man in charge of even a small launch engine derived very little pleasure from the sport.

TAMBOUR—TYPICAL OF THE SEAWORTHY, COMFORTABLE SMALL CRUISER MADE POSSIBLE BY THE DEVELOPMENT OF THE GASOLENE MOTOR.

Measure up with this the modern launch propelled by a gasolene motor. The engine is low in build and is set down close to the keel, so that it has no tendency to make the boat top-heavy—in fact, exactly the opposite is true. The modesty of the engine's demands on space permits the hull to be so formed that the cabin floor is low down, and with good freeboard a low roof will give the requisite headroom. Consequently it is possible to build a boat with no high, glass sides for heavy seas to smash in, and one that will go through rough water like a corked bottle. The greatest comfort possible in a small space is obtainable also because of the unobtrusiveness of the motor, which is often placed under the cockpit floor, in space that would otherwise be used only for storage. The motor can be kept almost as clean as a piece of furniture, and it radiates but little heat. There are no ashes to bother with, and the operation of coaling is replaced by a clean, rapid pouring of a liquid through a funnel into tight tanks placed in waste space in the bow and stern.

It seems probable that if the gasolene motor had not assumed a fairly practical form at a time when the demand for small power launches was becoming large and insistent, the steam engine would have been brought to a very high state of development, perhaps along the lines of the steam plants used in automobiles, or of the naphtha or alcohol vapor motor, which is merely a special and highly developed form of steam engine and which nearly monopolized the market at one period. The small kerosene-burning steam outfits that were at one time sold in large numbers had a very narrow escape from being practical, as they were light, compact and easily installed as compared with older engines and boilers. But there was still the heat from the boiler, intolerable in hot weather, the roaring of the burners with their steam jets and, lastly and forever, the whole boat reeked with the smell of kerosene and the odors that floated out of the smokestack. Perhaps with gasolene for fuel, a flash or semi-flash steam generator, higher pressures and more efficient engines, wonders might have been accomplished with steam; but it was not to be, for with the advent of the low, compact explosion motor the boiler, ash-pit and coal bunkers were discarded, the fire was transferred from the furnace to the interior of the cylinders and steam was allowed to drift away, forgotten, so far as the small boat was concerned.

It was in 1804 that Colonel John Stevens of Hoboken, N. J., built and installed in an 18-foot open boat steam machinery that came surprisingly near to the forms that are now considered of the first importance in modern steam engineering. The engines were directly connected and ran at high speed; steam was generated in a multi-tube boiler and sent to the cylinders at high pressure, and twin screws were used instead of the paddle wheels that were at that time and for some time afterwards considered the only practical propellors for power-driven craft. Though this boat actually puffed its way through the waters of the Hudson, it was not until thirty-three years later, 1837, that an attempt was made to use a steam engine to propel a small boat for commercial purposes. At this time Mr. Charles H. Haswell put a small beam engine and paddle-wheels into a large ship's boat and plied on the Hudson and East rivers. About 1870 the Herreshoffs brought out a number of small steam vessels that were far ahead of anything that had been produced up to that time, having fair sea-going qualities and being capable of making a maximum speed of about 12 miles an hour. Coal was the fuel. These boats were made as small as 20 feet in length, and were decidedly popular up to about 1885, reaching their zenith about

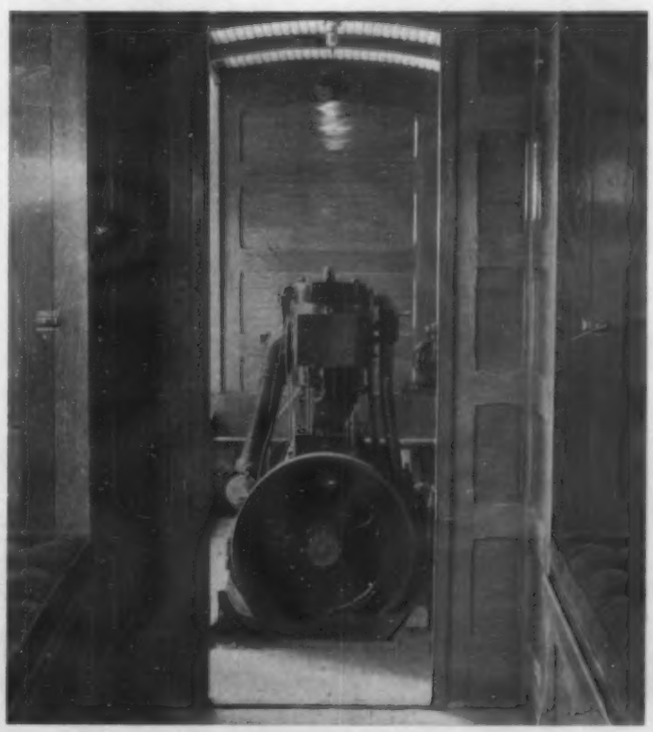
1880. In 1885 the naphtha engine, which was essentially a steam engine with naphtha in the boiler instead of water, was brought out and it kept a strong hold on the boating public for ten years. In fact, these engines are still manufactured, though in constantly decreasing numbers, and are frequently seen afloat.

In 1887, two years after the introduction of the naphtha motor, Gottleib Daimler, whose niche in the Mechanical Hall of Fame is a high one, used gasolene motors in Germany for the propulsion of launches, with such success that they were introduced into this country in 1889. Daimler's early engines developed about 12 hp and weighed 1300 pounds. There were four tall cylinders—in fact, these very long cylinders were characteristic of the Daimler motors, both afloat and ashore, for a long time, and they brought the total height of the marine motor to 4 feet 4 inches. The floor space occupied was 2 feet 5 inches wide and 5 feet long. Ignition was by hot tubes heated by Bunsen burners; the four-stroke method was employed. Though this motor was in sharp contrast to a modern marine motor of the same power, with its weight of 500 or 600 pounds and its floor space 18 inches wide and 36 inches long, the old Daimler was a great improvement on the steam power plants then used to produce the same amount of power, with their weight of at least 3 tons and their exorbitant demands for the best space. The installment of a Daimler engine meant practically the discarding of the weight of the boiler with its enormous added load of water and fuel, for the Daimler motor's weight just about balanced that of the average steam launch engine of the same power without the boiler.

For reasons that need not be enumerated here and which were not of a mechanical character, the introduction of the Daimler engine into this country was checked and the development of the gasolene motor industry seriously hampered at a time when judicious fostering would have done wonders for the industry and the sport. Nevertheless, the lesson of the new power was not lost, for by 1890 American marine gasolene motors were built in large numbers, most of them, however, of the two-cycle type. Practically no four-cycle marine motors were built at that time except in the larger powers, the somewhat deceptive simplicity of the two-cycle type appealing to the manufacturer at once. It was not long before the prospective purchaser of a small motor, up to say 6 or 8 hp, could choose from a large variety of makes, most of them having the same characteristics—a solid, weighty chunkiness, a low-set cylinder or cylinders bolted to or cast with a cast-iron crank case, a very heavy fly-wheel, a crude vaporizer and, if possible, a still cruder electric ignition system. In making the iron castings, liberality in the use of metal was considered far more economical than the labor necessary to keep down the weight, so that the average 1 hp motor of that early day weighed about 150 pounds; many were much heavier. This did not seem very detrimental, for the simple reason that there was nothing better—or, for that matter, as good—to be had, and the possibility of obtaining a small motor that could be put into a stoutly built rowboat and successfully used was so attractive to those who had balked at the weight, heat and smells of steam plants, that for a long time the "cook-stove" motor reigned supreme.

As exemplifying the crudity of the early motors, it may be stated that in many cases it was not considered necessary to have any special device for vaporizing the gasolene. A pipe led directly to the engine from the upper part of the fuel tank, the natural evaporation of the volatile fluid being relied upon to furnish the necessary vapor. A valve near the engine supplied the air necessary to dilute the vapor, and this required constant adjustment. The proportion of air required varied with the level of the gasolene in the tank and as the remaining liquid became less volatile, it also varied with the temperature of the atmosphere and its humidity.

A step in advance was made when air was caused to bubble up through the gasolene, making the evaporation more certain and less dependent upon atmospheric conditions; but many of the defects of the cruder method remained. A still further improvement was the use of wicking to absorb gasolene and expose it to the evaporating action of the air drawn past it by the suction of the engine, but this was about the best that could be done with the tank carbureter, and the next step was the special vaporizing valve or, as it is usually called, mixing valve. This is set close to the engine and contains a small orifice through which gasolene, piped from the tank, flows as air is drawn in through a large opening, the air and gasolene mixing and passing together to the engine. The flow of the fuel is regulated by a delicate needle valve and the air opening is also adjustable. But this contrivance had to be carefully made and constantly watched. The idea of an automatic carbureter for boat motors did not receive much attention at the time.



TAMBOUR'S MOTOR OCCUPIES A SMALL SPACE IN THE AFTER END OF THE CABIN AT THE FOOT OF THE COMPANION STAIR.

Ignition apparatus was in about the same state of crudity. A primitive make-and-break was the universal method of firing the charges in the cylinder, and anything that would make a contact before the top of the stroke and break it, making a decent spark, at about the right time, seemed to be quite good enough. Current economy was a very minor consideration, apparently, and in one engine we actually find a pair of electrodes in the cylinder head in constant contact, with current passing, except when a stud screwed into the top of the piston struck them apart at the top of the compression stroke and caused a spark. This was perhaps an extreme case, but it illustrated the stage of the development at the time. The rising and descending piston was such a convenient carrier for the ignition tripper that it was used by many makers, notwithstanding the fact that steel inside the cylinder could not retain a temper, electrodes

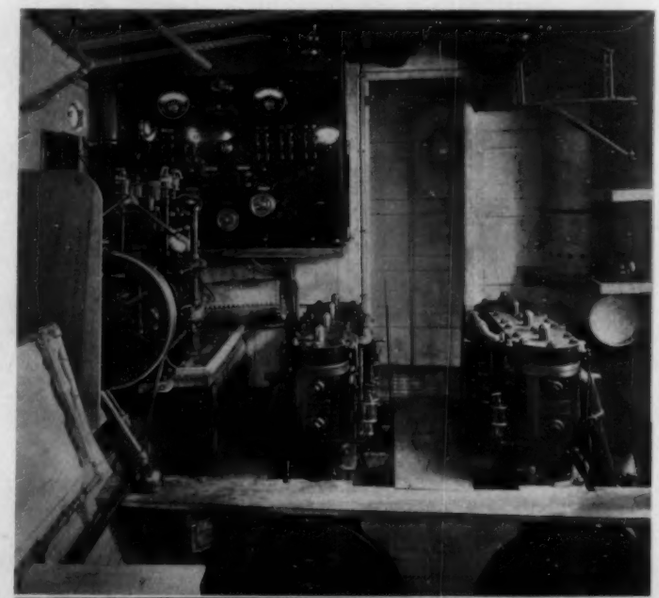
were subject to wear that constantly changed the time of ignition and required frequent adjustment, and they often became incandescent and caused preignition. Later the outside trip, operated by a cam or similar device, came into general use and held the field until the jump-spark, which requires no moving parts inside the cylinder, was introduced and found favor with a number of manufacturers and users, though the make-and-break is still the favorite for small two-cycle motors. Among the curious forms which the early motors assumed may be noted a four-cycle engine—lonely among the hundreds of two-cycles—with its cylinder inverted, the crank-shaft being carried in bearings above the cylinder and the propeller shaft driven by a chain running over sprockets.

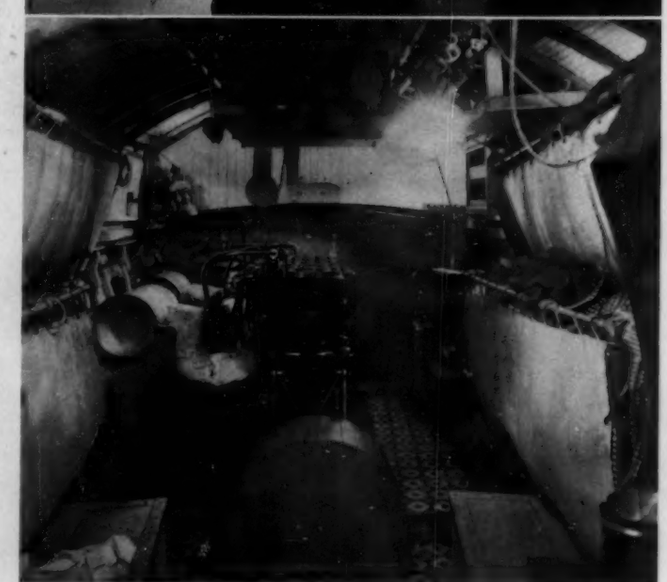
Naturally the widespread popularity of the gasolene motor had its effect on design, but for a long time there was very little departure from the familiar "fantail" stern, the vertical stem, and the glass-sided street-car cabin; the whole outfit having an inevitable tendency to "squat" or settle down at the stern when under way. Thousands of these boats were built and sold, being turned out by manufacturers in quantities, practically the same models being used year after year. The great demand for the boats was doubtless responsible for the slow progress made in the improvement of both hull and engine, manufacturers being able to dispose of all they could supply, and having no spur to urge them on to better things.

For years the gasolene-propelled automobile had been developing in France and, later and more slowly, in this country; and the very exacting conditions of service had brought the automobile motor to a much higher state of development than the launch motor, with its solid foundation, comparatively constant speed and freedom from shocks. In the year 1901 a few enthusiastic automobile experts in France were seized with an inspiration.

"Here in our automobiles we have motors that are reliable and enormously powerful for their weight. Who can tell," they asked, "what velocities might be attained by light boats with these motors to drive them?"

It was but a short time before the versatile Frenchmen were afloat in their experimental boats driven by automobile engines, and were racing each other at speeds that were at that time phenomenal for small boats. Then and there a new sport was born; then a new type of motor was called into being, new hulls were designed to carry these motors and an impetus was given to the development of the ordinary launch motor, for it was shown that weight could be brought down to such a point that it was an easily handled factor in the design of the ordinary launch of substantial build.





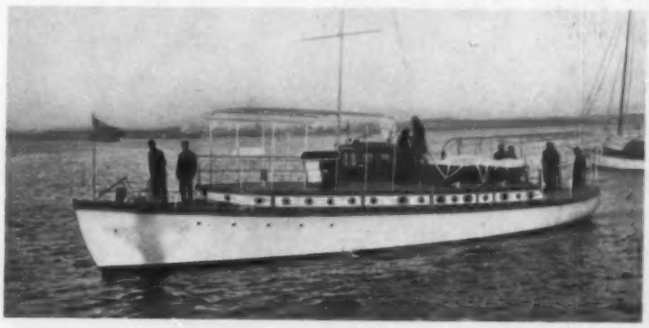
NORKA'S ENGINE ROOM—TWO MOTORS DRIVE TWIN SCREWS—NOTE THE COMPACT ARRANGEMENT—ELECTRIC LIGHTING PLANT DRIVEN BY SEPARATE GASOLENE MOTOR.

CACTUS II. HAS AN ENGINE OF MODERATE POWER, LEAVING ROOM IN THE ENGINE SPACE FOR BERTHS FOR THE CREW.

There are a number of more or less important reasons why the automobile engine, without alteration, is not entirely satisfactory for marine use, even in racing craft. The automobile motor is built to set with its crank case level, whereas in a boat it is almost always at an angle, so that the oil for the splash lubrication of the cylinders and connecting-rod bearings will, if not prevented, all run to the lower end, leaving the forward cylinders high and dry—literally—and flooding the other. Again, the delicate ignition apparatus is exposed in such a way that its operation is easily interrupted by salt water, and the dampness that is unavoidable plays havoc with the insulation of the high-tension current. Water and dampness also interfere with the efficiency of the carbureter. In fact, when the automobile motor goes to sea it develops many undesirable tendencies that do not show themselves ashore. So the "auto-marine" motor was evolved—an automobile motor adapted to marine service. In its extreme development it is a racing machine pure and simple, and as such it has done what would have been considered absolutely impossible not many years ago. For instance, a motor of 150 hp can be put into a 40-foot hull of the lightest construction, and 300 hp into a 60-foot boat. With such boats the 30-mile-an-hour rate has been exceeded, for short distances. Of course, the materials and workmanship in both engines and hulls are necessarily of the highest possible character. The degree of refinement in the design and construction of racing engines may be gathered from the fact that in large machines weights have been brought as low as 14 pounds per horse-power, and even less in a few cases. While such motors as these are of no practical use to the every-day launchman, they

have the same effect on the ordinary cruising motor that the racing automobile engine has on the touring car motor. The necessity for strength combined with extreme light weight, reliability of operation, and so on, bring out methods and forms that can be modified and advantageously used in motors for heavier boats. As a result, it is an easy matter to obtain stock models of motors of, say, 50 hp weighing from 30 to 40 pounds per horsepower, but still strong and capable of continuous duty, day in and day out, in a cruising boat. This being the case, it is not surprising that the modern yacht builder can readily turn out a roomy, comfortable, safe cruising launch of, say, 50 feet over all, that will travel 15 miles an hour.

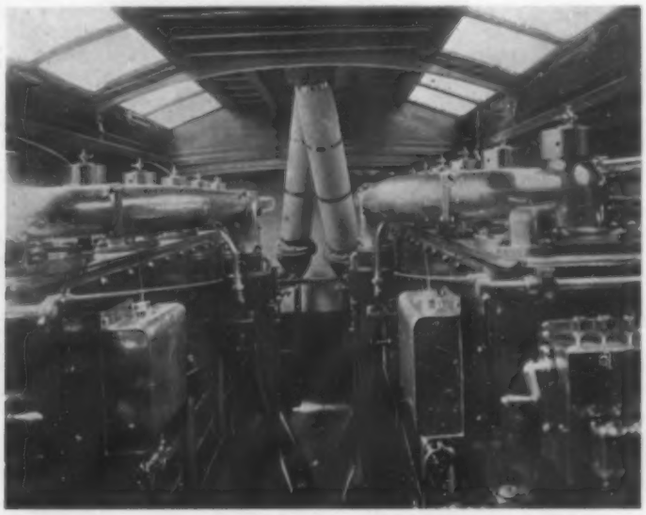
The four-cycle engine is the typical and almost universally used automobile motor, and it is but natural that the typical automarine motor should also operate on the same principle; this is the type that has received the most attention and is the most highly developed. On the other hand, the two-cycle type predominates in smaller sizes. To be sure, there are large two-cycle motors and there are small four-cycle motors, each with its adherents who believe firmly—and with plenty of reason—in the types they prefer; but it will probably be quite near the mark to say that in motors of more than 20 hp the four-cycle principle is dominant, while under 15 hp there are more twos than



NORKA, USED BY THE UNITED STATES GOVERNMENT FOR THE INSPECTION OF COAST DEFENSES—AN UNUSUALLY ROOMY AND SEAWORTHY BOAT FOR HER LENGTH.

fours. Between 15 and 20 hp the two types are pretty equally represented. The refinement of the four-cycle motor at once influenced the two-cycle through direct competition in the larger sizes and through critical comparisons in general. So both have shared largely in the general improvement, and the machines now turned out by the better class of manufacturers are very different from the "cook-stove" motors of a few years ago, thousands of which, however, are still chugging their noisy and more or less reliable way in many waters. Close work in making patterns and castings and an increased efficiency—the development of more power for a given cylinder size—have resulted in a great reduction of weight per horsepower, and the use of the best grades of iron for the castings, steels for crankshafts, rods and pins, bronzes and babbitts for bearings, the best carbureters and ignition apparatus, effective and reliable lubricating devices, and so on, have made the two-cycle motor a really wonderful machine. And in all types the noises due to mechanical causes have been reduced to a very small minimum by good workmanship, and the barking of the exhaust has been muffled to an extent that was not possible in the early days of the marine gasolene motor. The muffler question, however, is not yet fully answered; really silent exhausts are comparatively rare and vociferous barkers too common.

The unobtrusive gasolene motor, unlike the dominating steam power plant, can be placed at almost any point in the launch from stem to stern. Thus we have launches with their motors backed clear into the stern, and, in case of a cabin boat, covered by the cockpit floor with, perhaps, the fly-wheel projecting into the cabin At the other extreme we find launches with their motors under the forward deck. This arrangement is used sometimes for open boats, and has the advantage of leaving the cockpit floor clear for chairs. And every intermediate position between these extremes has been occupied by this adaptable machine. It is obvious that a motor that can be put almost anywhere, without seriously affecting the form of the hull, makes possible a form of boat that is best fitted to the wants of the cruising man. Generally speaking, the weight of the motor is but a slight restriction, and in any case it is low down, adding to the natural stability of the hull. Moreover, it has no heavy parts extending upward. Thus the designer is left free to produce a boat that will combine comfort and seaworthiness in the highest degree. The low-cabined, beamy boat, with headroom inside obtained by giving plenty of freeboard has resulted, and the tests that boats of this type have successfully weathered have proved that it leaves little to be desired. With a tightly closed cabin, the engine under cover and dry, and



ENGINE ROOM OF FAST CRUISER DODGER—TWO 6-CYLINDER MOTORS OF 600 TOTAL HORSE-POWER DRIVE THE 90-FOOT BOAT AT 25 MILES AN HOUR, MAXIMUM SPEED.

a self-bailing cockpit, the trunk-cabin launch with a reliable gasolene motor is a very hard nut for the storm demon to crack; for it not only has stability and buoyancy, but its form is such that it has great strength to resist the pounding of heavy seas.

For boats of light draft in which it is desired to install much power, two motors are often used to drive twin screws. In large launches an auxiliary motor is frequently used to drive a dynamo which generates current for electric lighting and for the motor ignition system, sending its current to a storage battery, whence it is drawn. Sometimes such a launch, which has almost the dignity of a yacht, carries a tender with a diminutive but most energetic gasolene motor to supplant oars.

While it is not difficult to bring forward plenty of mechanical arguments to prove that the well-built explosion motor should be as durable as a steam engine, which is usually expected to outlast the hull in which it is placed, there is really no better proof than that gasolene motors are being adopted rapidly by fishermen, to whom the matter of getting to port with a cargo of fish is an object of the deepest importance, and to whom an unreliable, poorly built motor would not only be an intolerable nuisance, but a quick money loser. Further proof is found in the use of motors for the propulsion of lifeboats.

Tight Little Craft

A "SPORTY" BOAT IS THE DORY AND STEADILY GROWING IN POPULAR FAVOR—EVOLVED BY THE YANKEE FISHERMEN, IT HAS LONG WEATHERED THE PERILS OF THE GRAND BANKS—NOW PLEASURE SEEKERS HAVE ADOPTED IT—TRIPS ACROSS THE ATLANTIC—AN INTERNATIONAL RACE

By ARTHUR F. ALDRIDGE

THE dory now cuts an important figure in yachting, and these small boats, the product of Yankee fishermen, have in the last few years become so popular that there are a few to be found in the fleets of almost every yacht club along the coast. So popular are they with yachtsmen that in New England they have a dory association, which has this year arranged with the Shelburn Yacht Club, of Nova Scotia, for an international match.

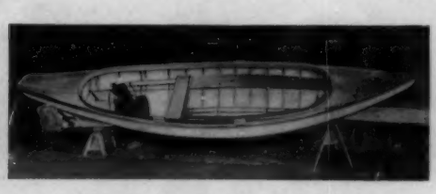
It is not only on account of its cheapness that the dory is popular but because it is a safe boat, and has done remarkably well in all weathers. It is fast, too, for a craft of its size, and those members of the clubs who have special classes for dories have had more fun with them than has often been furnished in classes where the boats cost ten time as many dollars as a dory does.

The dory attracted attention first because it was noticed that the fishermen used them, and the fishermen who put out to sea from Gloucester and other New England ports are famous all the world over, there being no better or braver sailors to be found anywhere. These men proved that the dory was a serviceable boat, and the yachtsman who is always looking for something new followed the fisherman's lead. The dory was tried as an afternoon pleasure boat and it proved itself a good one. It is not a boat for comfort; it is cheaply but strongly built, it is safe and has sailed through storms where boats more fancifully constructed have failed. Now dories are to be found everywhere. They were carried in nests on the decks of the yachts that took part in the last ocean race, they have been rigged with mainsail and jib and used as sailboats; they have been fitted with motors, and the motor dory is as popular "down East" as the sailing craft or the rowboat, and some designers have tried to improve the model and make it a little more fanciful, but it is doubtful if they have succeeded, and it is certain that they have produced a boat that is not a dory, and to designate it as such is a misnomer.

In many clubs these small boats, that originated in model with the dory, are still called dories, but the fact that they have round bilges, overhangs and sometimes weighted centerboards, has spoiled them.

The dory was originally built for use on fishing schooners, not only because of its seaworthy qualities, but also for the reason that fishermen were able to carry them on the decks of the schooner in nests that took up little space. Fishing formerly

GRAVESEND BAY DORIES.



DORY FITTED WITH MOTOR.

ACROSS THE LINE IN A "BUNCH."

A CROWD OF RIVERSIDE DORIES—SO-CALLED.

was done entirely with hand lines over the side of the vessel, and then the schooner needed only a yawl, but the method has changed now, and a number of small boats are carried, and when the cod grounds are reached they scatter away from the vessel, each boat on its "own hook," and after a load is obtained they return to the schooner. The dory is built in five sizes, designated by length on the floor, namely, 12, 13, 14, 15 and 16-foot boats. The different sizes are used in different fisheries, the small size being for hand-line fishing, the others for haddock trawling and the largest of all for halibut.

The boats carried by any one schooner are usually of the same size, for the reason that when the thwarts are removed the dories of a special size will stow away within one another in a nest. Five or six boats will thus occupy no more space on deck than one. Experience taught the users of these craft the best shape and sheer for a dory, and now the boat has reached almost perfection in form. They are swift, easily handled, capacious and safe, and if properly managed are hard to capsize. Occasionally one is tripped by a wave, but such occurrences are rare, and there are instances on record in which some daring sailors have crossed the Atlantic in them.

They are built mostly along the New England coasts, and a stock dory will cost not more than $12 to turn out, and will sell for $18 to $25. In the shops where they are made the work is systemized. Each man has a special task to perform, such as the getting out the "boards" for the floor, the planks for the sides, the frames or other pieces, the fitting of the several parts together or the painting and finishing.

The frames of the dory are spaced 27 to 30 inches apart. They are of white oak, and are cut from natural crooks when the stuff can be obtained, but because of the difficulty of getting a large supply of natural elbows a patent iron drowel has been invented for uniting two sticks of oak into an elbow. In making the dory the first step is to cut out the floor of the right length, width and outline from two or three ⅞-inch white pine boards, grooved and jointed at the edges. The boards are driven tightly together and fastened by laying floor strips of oak across them midway between the places for the frames and nailing them strongly to the boards. At the bottom of the boat is to be given a 3 or 4 inches sheer. The frames, made in the meantime, are put in position on the floor and nailed. The stem-post, with its knee, is placed, as is also the narrow V-sternboard and its knee. The planking is of white pine about ⅝ inch thick, and is cut from planed boards with the aid of a wooden pattern or moulds, the edges being beveled so as to lap. There are three strakes on each side of the boat.

Thirteen-foot boats have two thwarts, 15-foot dories have three thwarts. The top length of a 13-foot dory is 15 feet 6 inches, of a 15-foot dory 19½ feet. The sides flare from 12 to 15 inches amidships. These boats are very light for their size, the 13-foot size weighing about 190 pounds. They float like an egg-shell on top of the water, drawing 3 to 5 inches only.

In fitting dories for sailing a mast is stepped in the forward thwart, and a leg o' mutton sail and jib is hoisted. The jib sets on the stem head. A centerboard is fitted just aft the mast, the trunk reaching up to a level of the sheer strake, and the board is hoisted or lowered by means of a hook. The board of the regulation dory is not weighted at all, and often when not on the wind the board will float up. A 13-foot dory fitted with gratings in the bottom, centerboard, rudder and tiller, one pair of oars, two pairs of rowlocks, the leg o' mutton sail, jib and spars can be purchased for $65. A 24-foot boat, which will be 19 feet over all, is worth $70 complete, and a 15-foot dory that is 20 feet over all costs complete $75.

Now, it has been said that yachting is a sport that only the wealthy man can take part in. It is sport for a wealthy man if one has the money to spend and the inclination to spend it, and big racing sloops or schooners can cost just as much as one wishes to allow. There are many classes of yachts, however, that only cost little money, but it is very doubtful if any have yet been built that will give the satisfaction that the dories do for so little money.

Some owners of these dories have very much improved the way the craft are rigged. The mast is well stayed with wire rigging, which materially helps the boat when being sailed in a good, brisk wind, and the jib is set up on a head stay which enables it to be more easily handled. The American Yacht Club, at Milton Point, last summer had a fleet of thirteen of these boats, and the members rigged them in this way. They also carried ballast. The members of the Crescent Club had a fleet of thirteen boats, which, however, were sailed as originally rigged, but the rules of the dory association allowed each boat to carry 150 pounds of ballast in bags, which could not be shifted during a race. It was found that the boats were so light that when turning to windward they did not point at all well until they had the ballast on board, and then those members who experimented most decided that it was advantageous to carry this ballast well forward so as to keep the bow down.

At Milton Point a series of races were sailed last season that lasted throughout the summer, and the contest was keen and exciting to the finish.

GREGARIOUS CRAFT—DORIES RACING AT MARBLEHEAD.

At Bay Ridge, the Crescent men had ten contests, which created lots of fun during the summer. The boats there were sent over triangular courses of about 4 miles in length, with one leg, or one-third of this distance, windward work. The tides off the Crescent Club house at Bay Ridge run strong, and it required some good local knowledge to sail the boats to advantage, but very often during the summer these dories covered the 4 miles in less than an hour. They are seen at their worst in turning to windward in strong winds, when they will lay over so far that the wind spills out of their sails, and they will go to leeward fast, too, but in a breeze under which they can stand up, say about 9 or 10 miles an hour, they do remarkably well.

During the season of 1906 only two boats capsized when being raced, but being built entirely of wood they floated, and the spilled sailors simply had to hold on until picked off by a launch. The first capsize was caused by gybing. The wind was not strong, but the water was rather rough, and the dory had shipped quite a little water, which could not be bailed out before it was time to gybe around the mark. The member sailing the boat was too careful. He trimmed in the main sheet and let the sail go over easily, and when it filled on the other gybe the boat took a knock down, the water ran over the lee rail, and she slowly filled and would not come up again. The other accident was in a match race, sailed by boats representing the American and Crescent Clubs. It blew half a gale that day and rained hard. It was so late in the season that a postponement was out of the question, and rather than give the race up it was agreed that the boats should sail over a course inside the harbor. Just as the preparatory signal sounded one of the Crescent boats was gybed. The member in charge had mistaken the signal and wanted to get to the line quickly. He, too, made the mistake of trying to let the sail over easily, so when it filled the boat heeled over, took water over her rail and quietly settled. The race was won by the American Yacht Club, and the members of that club will go to Bay Ridge this season for a return match.

Marblehead is the home of the dories. They were originally built not far from that port, where small sailing craft make their headquarters in the summer and where on a regatta day from two to three hundred sailboats can be counted as they pass out by the light on the Neck. The clubs in that locality recognize the dories, and have championship races that are hotly contested. Two sisters, the Misses Wainwright, won last year, and they sailed their boat in all weathers and under all conditions with great success. A fog, characteristic of Marblehead, shut down last summer at the close of one of the dory races. All the boats got safely into port except the one sailed by the Misses Wainwright, and all night long launches were out trying to find these two girls and their boat but without success. Toward morning the fog lifted, and a dory was seen anchored under the lee of one of the many islands on the north shore. The sail had been lowered, and spread over the boat to make an awning, and under it were the two sisters calmly sleeping, while half of the summer residents of Marblehead were fearing that they had been driven out to sea or drowned.

THREE CRESCENT DORIES.

Small as these boats are and with absolutely no accommodation for comfort some of them have made long cruises. A few daring navigators have crossed the Atlantic in dories, but these boats have been larger than those used by yachtsmen, and are specially built for the purpose. Last summer, Mr. George Gardiner Fry, of the American Yacht Club, started on a dory cruise East, following the fleets of the Atlantic and Seawanhaka-Corinthian Clubs. The first day's run was from Oyster Bay to Morris Cove, and the course over which the yachts sailed was about 40 miles in length. Mr. Fry's small boat, of course, was left far astern by the bigger craft, but reached its destination, and the next morning started with the fleet again for New London, another 40-mile run, and then went on to Shelter Island. The dory reached that port without mishap, and later sailed back to Oyster Bay and Milton Point.

Of the Crescent dories, those owned by Mr. P. H. Langden, Mr. J. S. Campbell and Mr. J. W. H. Bergen made some long trips. One cruise made by the New Moon, owned by Mr. Langden, was around Staten Island, and another was down the Lower Bay and across to an old hamlet on the New Jersey shore, where the adventurous voyagers stopped over night, returning to Bay Ridge the next day.

A man who wants only a small boat cannot do better than get a dory, and if he is at all ingenious in fixing up things himself he can turn the dory into a good comfortable craft that will be absolutely safe under all conditions of weather. Watertight bulkheads can be built in the bow and stern of sufficient size to keep the boat afloat, the rigging can be improved so that there is little likelihood of the mast carrying away, and with a stick well stayed the sails can be made to set better. A weighted centerboard, and perhaps a rudder a little larger than the regulation one, will also improve the boat.

The dories will this year figure quite prominently through the international race that is to be sailed. The cup for which these boats are to compete is of silver. It was originally presented to the Shelburne Yacht Club by Mr. Frank Lovitt, and was won by Mr. W. A. Wagner. Mr. Wagner has offered it as a challenge trophy, and it is to be known as the Lovitt-Wagner Cup. The Massachusetts Dory Racing Association will hold trial races in June, to select three boats that are to be sent to Nova Scotia in July, and the Shelburne Yacht Club will also hold trial races open to boats enrolled in the Shelburne, Yarmouth and Halifax Clubs, to select three defenders of the cup. This race is for the ordinary dory, and the restrictions govern them very thoroughly. Since the Yankee dory became popular improvements in some ways have been made on the models. The Riverside Yacht Club three years ago had a class of so-called dories that were named after the club. These boats were 21 feet over all and 6 feet beam. They were built of hardwood, decked and provided with a washboard around the cockpit. They were rigged with a gaff mainsail and jib and weighed 680 pounds. The cost was $165 each.

The Bensonhurst Yacht Club last year had a class of what were called clipper dories, but there is very little of the dory in their model. The boats were designed by C. D. Mower, and were very popular. This year a committee has framed restrictions to govern the class and several more are to be built. These boats are now to be known as the Gravesend dories and will cost about $250 each.

Turn from the dory's utility as a pleasure craft, to the sordid annals of trade. "Sordid?" well, perhaps. If it had not been that higher wages were paid during the winter, perhaps the fishing schooner America could not have obtained a crew. Perhaps she would not have tempted fate off Barnegat. However, she did; the morning smiled with promise when her dories put off to set the trawls, and the ocean smiled back at the sky; when the boats were well away from the schooner, the wind suddenly shifted to the northeast. There was death in its touch now, and the wary boatmen at once started for the schooner. But a great snowstorm, borne on the wings of the new gale, enshrouded them. The boats were separated one from the other, and the storm, now an impenetrable, swirling, leaden barrier, had long since shut the schooner from sight; the sea, raging under the lash of the gale, tossed the line from crest to trough as if trying to capsize them, but the dory had been built for just such an emergency. The baffled waves beat at the sides as if to crush them in, but their force was such that the powerful bulk split and glanced off. All day the battle between the dories and the elements went on; then nature gave the fight to the tiny plaything. She hushed the wind and stilled the sea; and the gallant bit of wood that had lain for hours between man and his last enemy, bore its frost-bitten burden back in safety to the schooner.

The Joys of Canoeing

By E. T. KEYSER

THE canoeist is the most independent of men. He can push his craft through a stream 3 feet wide and 5 inches deep, and he can safely negotiate any bit of water that a catboat or moderate sized launch would care to attempt. Canoeing is popular, because it brings its devotees out into the open freedom, and lets them live their summer life as they will. The canoe does for humanity what the bicycle failed to do. The bicyclist was tied to roads, was dependent upon hotels and restaurants for food and lodging. When the hill was steep he must alight and walk. When the road was bad, or the foot of the hill dubious, he must do likewise. The canoeist suffers none of these restrictions; he carries with him his place of abode, his bed, his food and the means of preparing it.

He is not confined to well-worn highways, he is able to penetrate and explore out-of-the-way streams, and pitch his tent in spots inaccessible to the average wanderer. The ability of canoes to carry their owners into places where even a rowboat could not be manoeuvred, gives to the paddler a point of view not often obtainable by any one else. Even in the vicinity of large cities he is able to discover numerous pleasant, but unknown, locations reached by water that he has practically to himself.

This means that, if the canoeist is a photographer, he is able to take views which none of his acquaintances possess. If he is a fisherman or a gunner he knows of sequestered nooks where the fish may be had, or where, even in communities supposed to be shot out long ago, some game still lingers.

For years canoeing was practiced by a few enthusiasts, who held their heavily rigged sailing craft right-side up by gymnastic contortions on the end of a sliding seat, or who paddled around in light, fast, open cedar craft, whose stowage capacity was limited, and which, to the uninitiated, appeared unpleasantly liable to capsize on slight provocation.

With the advent of the canvas-covered canoe, built somewhat after the lines of the Indian birch bark, but with flatter floor, and in every way a stronger, stauncher craft than that of the red man, the interest in canoeing increased rapidly, and many who had fancied that a canoe was an invention of the evil one discovered the error of their ways.

The canvas-covered Indian model paddling canoe as built to-day is designed to carry a tremendous amount of luggage on a very light draft. She is not, as a general thing, a particularly speedy boat, but will go right along at a moderate rate with a most immoderate load and a crew of two.

Then, too, such a boat allows a most beautiful elasticity in regard to camp equipment. Her owner may be an exponent of the simple life, sleep upon his cushions in a little wedge tent, carry a tin plate, a knife, fork, spoon, saucepan, a frying pan with a removable handle, pack his food in a tin bucket, wrap his blankets in a rubber poncho, and enjoy himself to his heart's content roughing it.

A CAMP UNDER SHELTERING HILLS.

On the other hand, he may be a luxurious individual, who, in camp, surrounds himself with almost all the comforts of a furnished flat, and whose abode is a marquee tent with an awning front, who eats from aluminum ware on a folding table, and whose $20.00 - air mattress is spread on a $4.00-folding cot. Whatever variety of outfit is carried a 17 or 18-ft. open canvas canoe has plenty of storage room for it.

ON THE STARBOARD TACK.

WHERE PLEASURE AND EXPENSE DO NOT GO HAND IN HAND.

As a matter of fact, however, the man who steers his course midway between the two extremes is generally the happier individual as well as the wiser. He is, as a general thing, a man who has started at either one or the other extreme, and increased his outfit up to the comfortable point, or decreased it, with a view to cutting out articles requiring too much time and trouble to arrange for use. The canoeist's outfit consists of a 7 x 7 pyramid tent of drill, made waterproof, with a mosquito-net window in the rear for ventilation. The floor of the tent is of brown waterproof canvas, permanently sewed to the bottom of sides and back, with a 9-inch sill across the front.

He contents himself with an air bed and air pillow, a couple of light-weight, warm, all-wool blankets, a canoe cushion filled with tufted hair and covered with brown waterproof canvas. His table, by an ingenious arrangement of folding legs and rolling top, packs in very small space.

The legs and back of his chair fold and collapse into a bulk of about the size and weight of a baseball player's bat, around which the seat of the chair, being of canvas, may be tied. His dishes and food are carried in a large tin bucket, while his demijohn is made of waterproof canvas. Such an equipment is thoroughly practical, comfortable and occupies but very little space. Often two or three canoeists club together, the one with the greatest amount of leisure time paddling up to camp early in the day, and pitching the tent, so that when his two companions arrive late in the afternoon, everything is ready for the night.

What seems an objection to some is the cost of canoe and camp outfit. It is true they cost money, but both craft and outfit represent an investment, not an expense. A man who in the old days could afford a hundred dollar wheel, was subjected to the expense of buying his meals at restaurants and, should his trip extend beyond a day, he had to pay for lodging. Now, as a matter of plain business, the difference between the weekly outing expenses of a canoeist, who buys his food raw and prepares it himself, sleeps in his own tent, and what he would have to pay for similar food and lodging if he was any other sort of a sportsman, would, in a short time, cover the entire cost of his equipment.

There's no sport equal to canoeing in the eyes of those who have once indulged therein. It has a hold and a fascination on those who practice it, and there are to-day among the ranks of canoeists many men of middle age who are as enthusiastic now as they were when they first dipped paddle.

For the summers he has spent with paddle and kit have given him winters filled with pleasant memories, with thoughts of sparkling brooks and pure blue lakes, of limpid shallows and sombre depths; in his mind he hears the splash of the rapid, and again there flows over him the thrill of the fight therein—of boulders avoided and upsets escaped—he thinks of all these things and more, for at heart the canoeist is a poet.

READY FOR PAINTING.

WHEN CRAFT BEGIN TO APPEAR FROM THEIR COVERINGS.

RIGGERS AT WORK.

Putting the Yacht in Commission

WHEN ROBINS FIRST APPEAR, THEN IS THE TIME TO STRIP YACHTS OF THE QUEER WINTER COVERINGS AND PREPARE THEM FOR THE POETIC SPORT—WHAT TO DO AND HOW TO DO IT

By C G. DAVIS

WHEN you see those big, red breasted robins hopping about in the grass you can also see the blue-suited sailors in overalls or white ducks, rolling up the heavy canvas covers or knocking apart the wooden pent houses that have protected the yachts' decks from the snows and ice of winter. This is the first sign of a yacht going into commission. In a yard, where many yachts are stored each winter, there are certain customs to be observed that have descended from time immemorial. One is that no outside mechanics shall do the painting of the hull from the rail down. The yard keeps men for that purpose, and they rightly claim that work as their own. Another is that all supplies, such as varnish, ropes and the like needed in overhauling are to be purchased from the yard. From the rail up, decks, interior, spars and rigging, the skipper of the yacht usually does the overhauling or has his sailors do it. Carpenters and plumbers are supplied by the yard. Sometimes a "green" owner, resenting the enforcement of this time-honored custom, will act "muleish," and try to get the work done more cheaply by hiring some outsider to work on his boat. What is the result? A yardmaster is liable to launch his yacht unexpectedly, and tell him to pay his bill and take the boat away. Others, apparently, conceding him the right to engage independent workmen, go ahead and put the yacht all in perfect shape ready for launching; but, unintentionally, of course, two or more yachts have in the meantime been slid over so as to completely blockade him from the water. Threats and entreaties are alike unavailing, and an extra week or two is allowed the owner, during which the value of abiding by the "custom" is strongly brought home to him, and he doesn't try to evade it a second time.

DRYING OUT BLOCKS.

The great secret of putting a yacht into commission is to know the proper routine. An experienced captain, familiar with this part of his duty, can save his owner his month's pay or lose it if he doesn't know how to go about the task.

The following programme may be observed in putting a boat properly in commission:

1. Uncovering and airing.
2. Cleaning inside, ballast, etc.
3. Scraping down, varnishing spars.
4. Scraping down and varnishing blocks.
5. Overhauling and repairing rigging and iron work.
6. Overhauling plumbing.
7. Scraping, varnishing rails and skylights, etc.
8. Cleaning and painting hull outside.
9. Cleaning and painting hull inside.
10. Small boats—Scrape and varnish or paint.
11. Spars hung and rigging rove off.
13. Launched—put duffle aboard and bend sail.
14. In commission.

Don't uncover your yacht until the weather gets fairly settled. If she has a canvas cover it's a very simple matter to rip off the small battens holding it on or to cut the cords by which it is laced down, and roll the canvas to the ground, where it can be spread out to dry, or if she has a wooden shed built over her, mark each board (1-S, 1-P, 2-S, 2-P, etc.), meaning number 1 starboard, number 1 port, etc., so that each may be identified in the fall when the cover is to be put on again.

Knock down the ridge pole and cut adrift the battens lashed along each rail. If it is a good clear day, open up all the hatches, skylights, doors and lockers wide, to let everything dry out, for the cover makes a boat sweat during the winter and the air below becomes close and dead. Even lift up the floor boards to ventilate the bottom of the yacht.

Large yachts with much expensive hardwood joinerwork generally need a man aboard all winter. He keeps a fire burning, and thus everything below remains dry and sweet, but on a small yacht, 40 feet and under, this could hardly be expected. The white paint on the ceiling and beams will often be found peeled off in flakes like flour, due to sweating and freezing.

If the yacht has inside ballast, and nearly every one does have some of it to trim by even if she be a keel boat, pass it all out and lay it on boards on the ground. If a hose and running water is handy, scrub the inside of the boat well with a whisk-broom, letting the water run off through the plug holes in the planking.

Continue this scrubbing just as faithfully below the floor, between the frames, as above it, for while the dirt will not show there, yet for lengthening the life of the boat it is more important to scrub under the floor than above. And if grease and dirt is not scrubbed off the painted partitions and doors the new coat of paint will not adhere perfectly.

OVERHAULING GEAR AND IRONWORK.

Scrub the ballast whether iron blocks or pigs of lead, and if of iron let them dry thoroughly, and then give them a coat or two of red lead paint before restowing. Like the thrifty housewife, who begins at the attic and cleans house, so the first steps in putting a yacht in order is to begin at the mast head and scrape down the spars, then all the dirt and shavings do not come down on fresh varnish. For this reason the decks are the last to be cleaned, often being left until the yacht is afloat and out at her moorings, away from the hob-nailed and dirty shoes of shore people.

On large craft a triangle of planks is slung around the mast so two or three men can sit and scrape the spar at the same time, as they are gradually lowered by those on the deck. But on small craft one man often has to do his own hoisting, scraping and lowering away as he sits in a bosun's chair.

Sailors almost invariably use their sheath knives to scrape down a mast; in fact, it would never do to give them anything else, for they would dig too deep with a file scraper, and could never keep an edge on a cabinet scraper.

OUT FOR SPRING OVERHAUL.

For small yachts the cabinet scraper is best, but to sharpen one so that the proper cutting "burr" is rolled upon the edge requires practice. The novice can do best with such a scraper and a file to sharpen it with. Cabinet scrapers are square or oblong pieces of saw steel, sold in hardware stores. An old saw can be broken up and made into the same thing. To sharpen a scraper, file diagonally across the edge slightly, beveling it, and then slick down the high edge with the smooth end of the file, so a smooth, slight burr is rolled over. This will cut off a paper thin shaving cleanly and quickly.

Sandpaper the spars after scraping, and if varnished give them three good coats of "Spar Varnish." Let each coat dry before the next is put on, rubbing lightly with fine, say OO, sandpaper, before applying another coat of varnish.

All light spars, such as booms, gaffs, yards, can be laid on wooden horses or boxes on the ground, and scraped much more quickly than if slung in place on the boat. It is a good plan on a small spar to take out all the lacing eyes along the boom and have a clean spar to varnish instead of one obstructed by all these eyes that will, no matter how careful you are, form puddles of varnish that look unsightly.

Scrape all the wooden shell blocks and varnish them, hanging them from a rope together with the wooden belaying pins, etc., to dry.

While the spars are drying, it will take several days for three coats to harden, get out all the rigging and give it a thorough overhauling. See that the serving or canvas or pigskin covering on splices and gaff bridles have not worn through. If it has, fix it now; it can be done with half the labor required to do it later, and done better.

Examine the standing rigging and turn-buckles, to see that they have not deteriorated through the action of rust. Nearly every yacht now has turn-buckles. Don't trust to iron ones to last very long. They are strong enough when new, but rust soon attacks them, and on small yachts often causes them to stick and twist off. Bronze buckles are more expensive, but they last so much longer that it pays to use them; they are safer, too.

To examine the manila rope untwist it and see if the strands are soft and rotten or sound. Don't reeve off any doubtful looking rope, it may prove expensive in the end. Overhaul and oil or grease the windlass bearings, and when the blocks are dry put a drop or two of oil on the pins. Look over and oil up the steering gear, and while there see that the rudder head fits tight and that there is no undue amount of lost motion.

All the plumbing should be carefully gone over before filling the tanks and new leather washers put in all cocks and valves. On large yachts the services of a plumber are indispensable, and if great care has not been exercised in laying up the yacht the owner will probably have several pipes split from freezing. The varnished work about the decks generally turns so dark and the wood so black where the varnish has worn off in spots, that it all has to be scraped clean and bright each spring and given a couple of new coats of varnish. If the scraping is done in rainy, squally weather, where the wet is apt to spoil the scraped work already done before varnish can be got on it, give it a coat of shellac. That dries almost instantly, and keeps the wood clear and bright until ready to varnish on some sunny, clear day.

GOING OVERBOARD.

The care which should be given the outside of the yacht varies with the manner in which the yacht has been built, the length of time she has been laid up and the place she has been laid up in. Some yachts always leak when first launched, but soon "take up," or swell, tight as a drum in a day or two. They could be caulked and made tight, but don't need it. Too much caulking is as detrimental to a yacht's welfare as too little.

If the caulking is sound, that is, if the cotton has not rotted, the seams can be filled by taking a bar of coarse brown washing soap and rubbing the seams full; this will keep the water out until the planks have time to swell tight.

If the caulking is packed hard and is black from rot, have it all hooked out and the seams re-caulked, then paid, puttied and painted. Take washing powder and fresh water and scrub off the white paint above the waterline, and remove any grease or dirt before painting.

If the yacht has laid hauled out so long that her paint has peeled off, or if she has been painted over and over so many times the paint is very thick, she should be burned off and then a new coat of prime and two coats of color put on to make a smooth, clean job of it.

Below water the non-fouling green and red copper paints are generally used, and each locality has its own particular brand, found by experience to be the best for those waters. The yard men generally do the outside painting; but keep your eye on them to see they get the waterline painted

SCRAPING THE MAST.

straight and true. By standing at first one end and then the other you can see whether the line is the same height on each side or not. Nothing looks worse than a freshly painted yacht with a crooked, wavy waterline. The interior paint and varnish work should all be gone over when the outside painting is done.

When the light work and spars are dry and shining with new varnish, put them all in place. Hang the main boom, ship the gaff and reeve off all the halliards, setting everything up in proper shape. Then you are ready for launching day.

Don't put all the duffle aboard until after the yacht is afloat, for she may leak, and you will want everything open, accessible and unhampered by carpets, cushions and the hundred and one odd things that accumulate on a yacht. If she doesn't leak, or when swelling has made the hull tight, it is time enough to pass things aboard. The dinghy is generally stowed in some kind of a shed, protected from the weather, and can be scraped and painted or varnished on days when the weather is too bad to permit work on the yacht herself. The dinghy should be ready to go over when the yacht is, and generally begins a very active career from the minute it strikes the water.

Putting the decks in order should be the last job of all. Bend the sails and trice everything up clear; start in with sand and holystones and grind the decks down white as snow.

If they are to be varnished, get several men and rush the job through; sandpaper well after scraping, and then flow on evenly three good coats of spar varnish, which, out at her moorings, away from the dirt and dust of land, will dry with a polish like a piano.

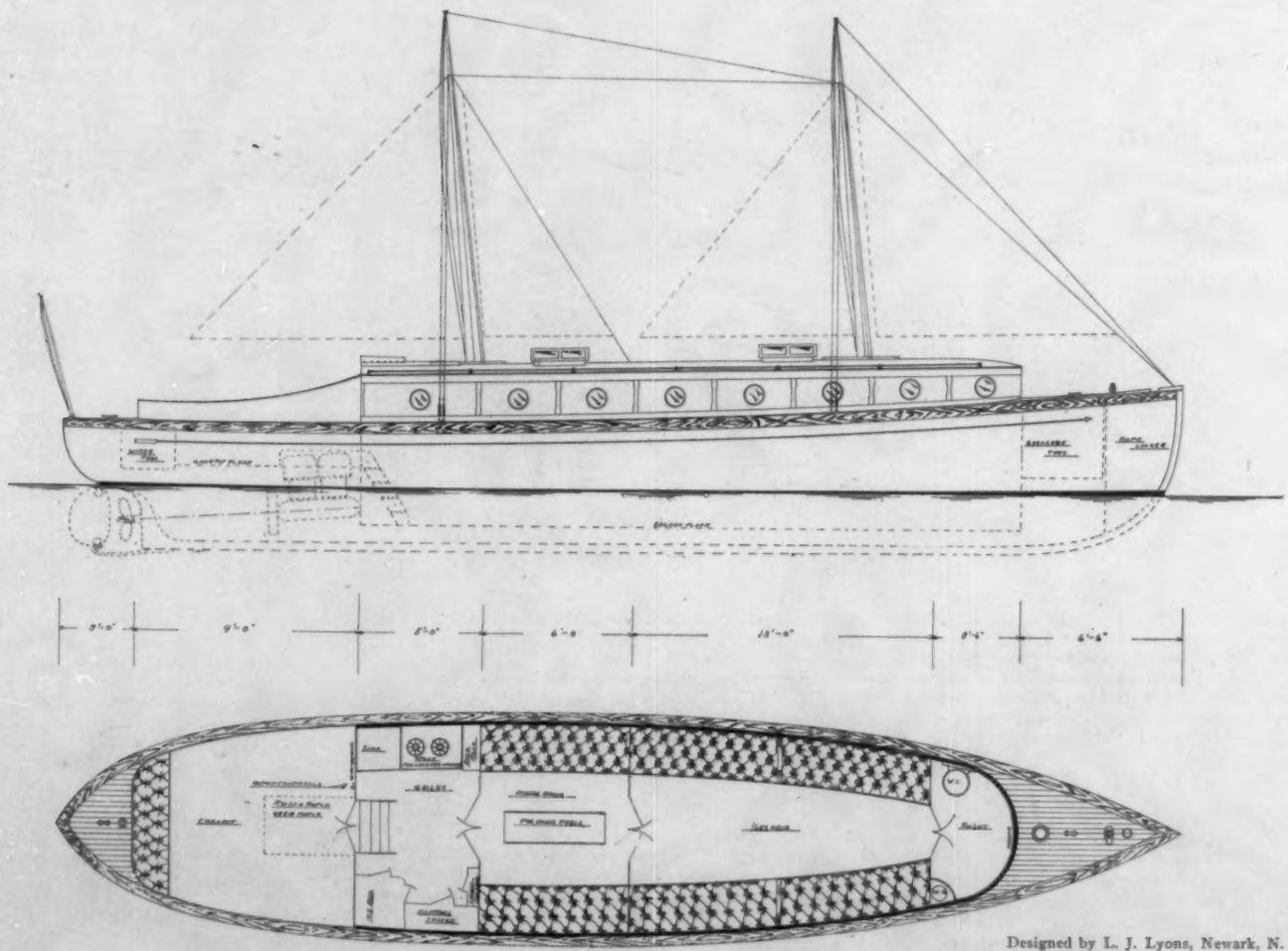
Plans of an Off-Shore Cruiser, Ketch Rigged

A BOAT designed for off-shore cruising is sure to make its appeal to the dyed-in-the-wool sailor who does not have a day's sport unless in that day he has had some battle with the elements. The plans of the cruiser here presented reveal "a good deal of a boat." Over all she measures 45 feet flat. Her load waterline measurement is 42.7 beam 9 feet, and draft 2 feet 6 inches.

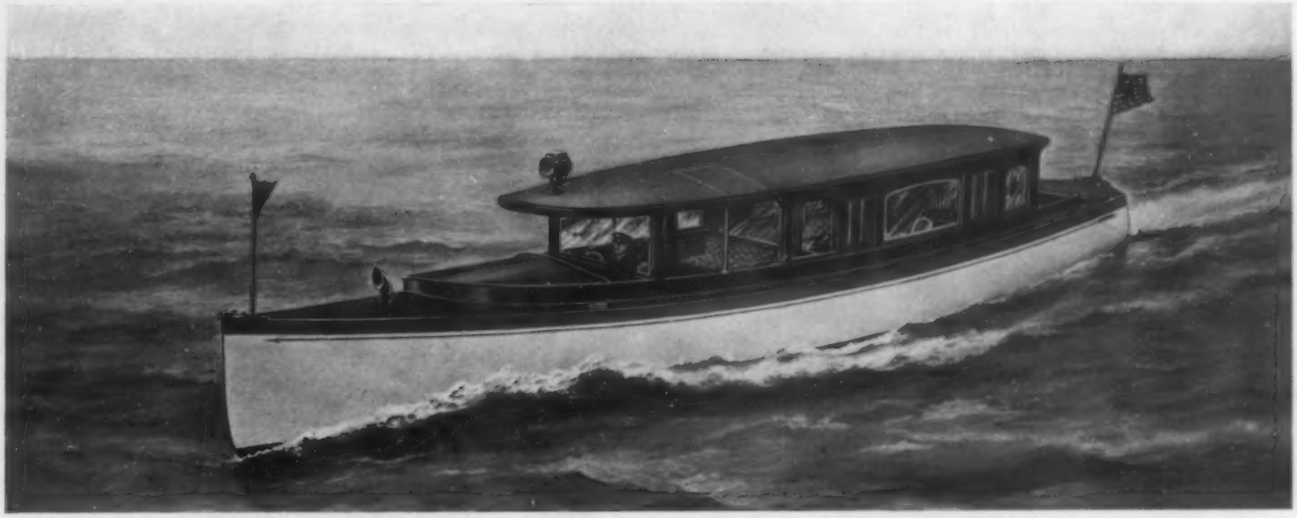
Her engine is a 60-hp. Napier, and will produce a speed of 12 knots an hour. She was designed to have accommodations for six persons, but no crew, the owners desiring to handle the boat themselves.

The saloon, which extends almost the length of the boat, is to be finished in Central America mahogany, inlaid with white holly. It is fitted with six extension berths, with lockers underneath for sails and provisions, and the after end is fitted with a folding table, and will be used for the dining-room. Abaft the saloon comes the galley and ice-box, with lockers and closets. The motor is located under the cockpit floor, with a grating covering it, thereby allowing of ample ventilation. The carlins are extra heavy and support the masts, one on the cabin roof, thereby allowing more room inside.

The steering wheel is located in the cockpit with the motor controls, so that one man can easily handle the boat.



Designed by L. J. Lyons, Newark, N. J.
Scale, 1 in. = 1 ft.



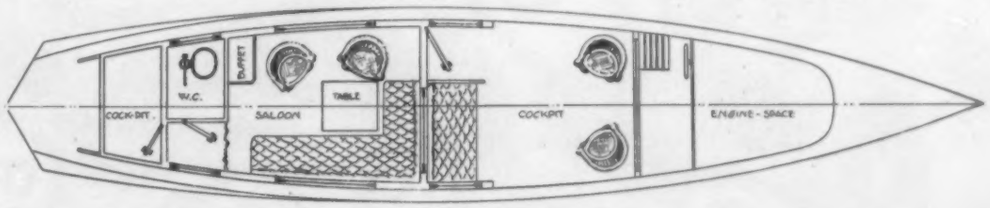
RACER AND CRUISER, TOO.

Plans of a Swift and Handsome Cabin Yacht

PLANS showing the construction of an 18-mile an hour boat, which, in addition to speed, is supplied with all the luxury and comfort of a cabin cruising boat, cannot be other than interesting and instructive. The craft, designed and built by the Electric Launch Company, lines of which appear, was on exhibition at the New York Motor Boat Show, and attracted great attention. There is unquestionably a large field for this type of boat. The following figures give dimensions:

	Feet.
Length over all	40
Beam	8
Draft, extreme	3

The hull is of substantial but light construction, with extra wide beam, 8 feet. Decks and interior are handsomely finished in selected mahogany, special attention being made to the joiner and cabinet work. The engine is installed forward under a hood, a new type now being built, 6 cylinder, developing 90 hp., starting by compressed air, with mechanical clutch for reversing and solid propeller. Control of engine and steering of boat is located at one point, enabling one man to operate the boat. A glass wind shield protects those sitting in the open cockpit from head winds and flying waters; this wind shield is easily lowered into a pocket when not desired. Attached to the roof of the open cockpit are side curtains, to be used in case of storm. Space is provided for seating eight or ten people in the cockpit in wicker chairs and on settee, as shown in the cabin plans. The cabin is enclosed with plate-glass balanced windows, dropping into pockets, and equipped with sofas, divans, chairs, buffet, ice-box, sink, cupboards, wine lockers and china closet for dishes and glassware. A lavatory compartment is provided, with yacht water-closet, wash-basin, mirror and the usual toilet articles. There is also located a cockpit aft for carrying luggage or small steamer trunks. This boat will have a speed of 18 to 20 miles an hour.

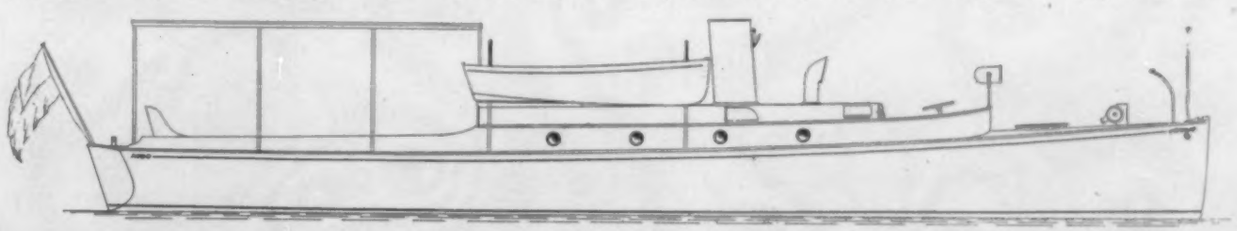


Plans of a Fast Motor Yacht

ARISING from the reaction from the engine-driven speed machine to the comparatively slow-cruising power boat, has come the craft of light, yet staunch construction, of more than average speed, and yet with comfortable accommodations for passengers and crew. Numbers of these boats have been turned out this year, and examples of great interest were to be seen at the various motor boat exhibitions held in this country in the past winter.

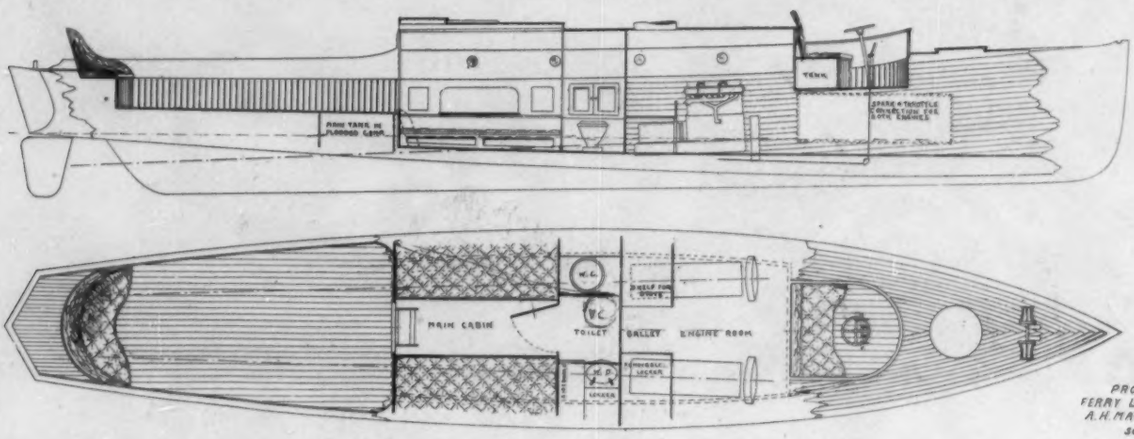
Manufacturers already report numerous sales of boats of this sort. The average yachtsman does not care whether his boat shatters records, but at the same time it is by no means his idea to be left behind by every motor boat with which he may happen to come in contact. He wants comfort, but he likewise desires to "get there."

For such as these the boat whose plans are presented herewith should prove eminently satisfying. She measures 45 feet over all and about 7 feet beam. A glance at the plans indicates that the



construction will not be too heavy, and speed is suggested in every detail. The cabin for passengers seems to be ample as also do the galley arrangements. Both of the cockpits are watertight and self-bailing, which, when one takes into consideration the high freeboard and the easy lines of the yacht, warrant the conjecture that in a sea she will prove worthy.

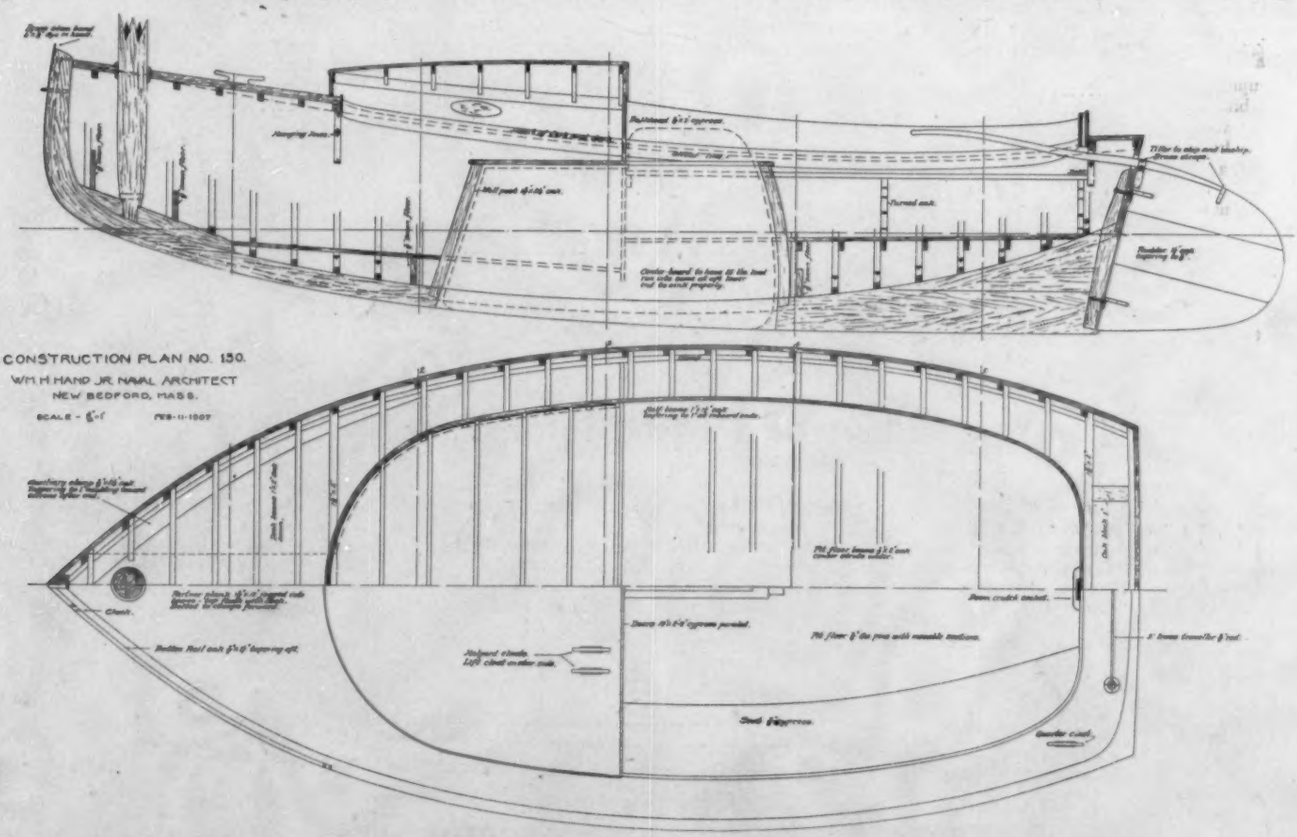
As to driving power, there will be two 60-hp. 5½ x 5½, 4-cylinder, 4-cycle engines, made by the Royal Motor Company, calculated to produce a speed of 25 miles an hour. The boat will be planked with mahogany and handsomely fitted, and is building by Messrs. Stearns & McKay for Mr. A. H. Marks, of Akron, Ohio.



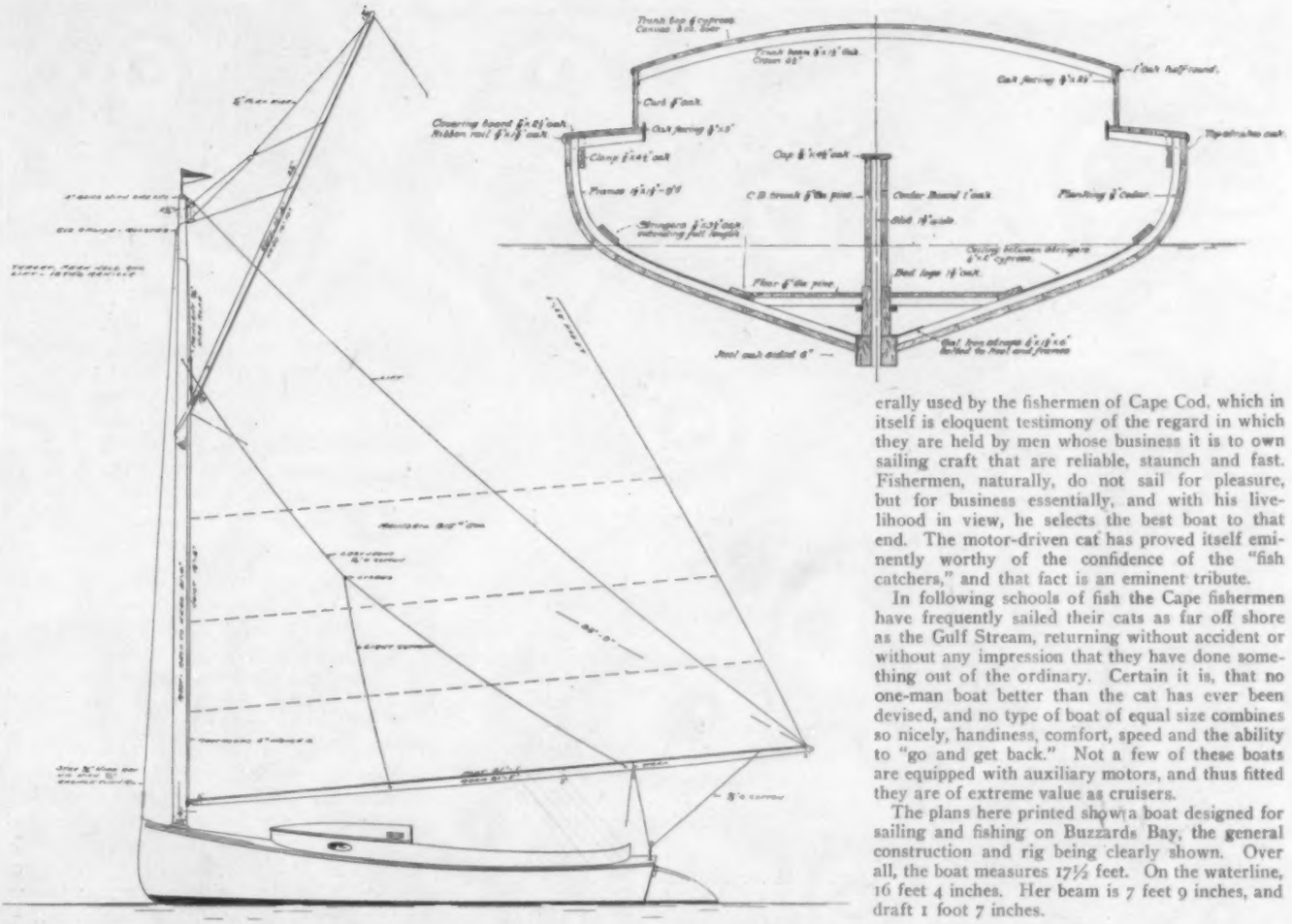
A Wholesome and Handy Catboat

"GIVE a cat a bad name." Thus the old adage, so far as catboats are concerned, might be paraphrased. They are cranky, unwholesome, unsatisfactory and dangerous. They are meant only for shallow waters, and even then upsets are more the rule than the exception. One hears this sort of talk constantly, and to correct what certainly appears to be an erroneous impression it is the gratifying privilege of YACHTING to reproduce the plans of a 16-foot boat by a well-known designer of this sort of craft.

As will be seen by the lines and the accompanying photograph, a typical "Cape Catboat," from the boards of William H. Hand, Jr., is represented, a type which has gained a deserved popularity all along the Massachusetts coast, where it is admitted to be as handy and efficient all-around small sailboat as can be produced. They are gen-



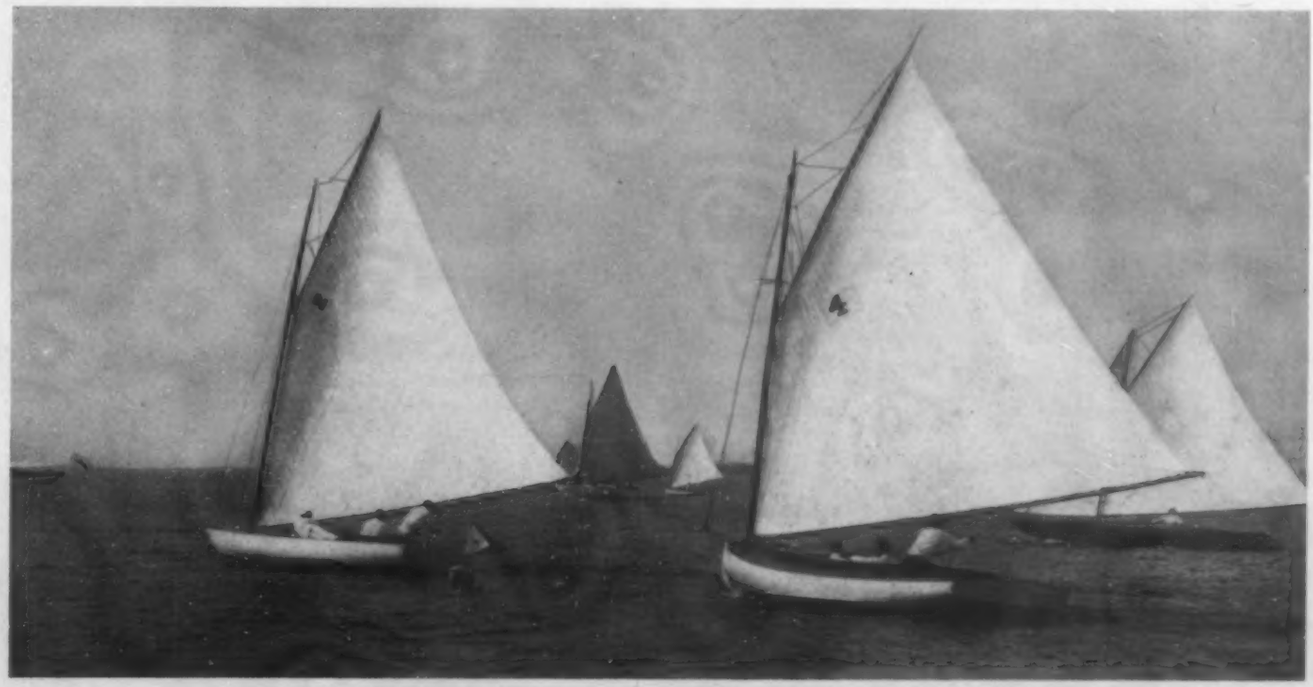
PLAN OF A CAT DESIGNED FOR AFTERNOON SAILING AND FISHING ON BUZZARDS BAY.



erally used by the fishermen of Cape Cod, which in itself is eloquent testimony of the regard in which they are held by men whose business it is to own sailing craft that are reliable, staunch and fast. Fishermen, naturally, do not sail for pleasure, but for business essentially, and with his livelihood in view, he selects the best boat to that end. The motor-driven cat has proved itself eminently worthy of the confidence of the "fish catchers," and that fact is an eminent tribute.

In following schools of fish the Cape fishermen have frequently sailed their cats as far off shore as the Gulf Stream, returning without accident or without any impression that they have done something out of the ordinary. Certain it is, that no one-man boat better than the cat has ever been devised, and no type of boat of equal size combines so nicely, handiness, comfort, speed and the ability to "go and get back." Not a few of these boats are equipped with auxiliary motors, and thus fitted they are of extreme value as cruisers.

The plans here printed show a boat designed for sailing and fishing on Buzzards Bay, the general construction and rig being clearly shown. Over all, the boat measures 17½ feet. On the waterline, 16 feet 4 inches. Her beam is 7 feet 9 inches, and draft 1 foot 7 inches.



A RACE—FAST AND STAUNCH CAPE COD CATBOATS, OF GENERAL TYPE SHOWN IN PLANS, CROSSING THE LINE.

THE APPROACHING SEASON.

ASIDE from the three sloops for the 57-foot class, the approaching season on the Sound and in New England waters gives no promise of the appearance of spectacular craft of large rating. Obviously, the trio of Herreshoff flyers will arouse deep interest, not only as regards speed per se, and seaworthiness, but the constructive elements utilized by the famous designers and builders in the production of these qualities. What lessons were learned through the Irolita? Has the uniform rule been observed in letter, or in spirit, or in both, if such can be? These questions and many more having to do with the application or non-application of lessons learned last year will have their answer when the new sloops are tried in coming regattas There will also be an interesting field for observation and deduction in the further performances of the 90-foot schooner Queen, and Effort, of the 60-foot class of sloops; the results of which, taken in connection with the achievements of the 57-footers, will largely determine the attitude of the New York Yacht Club toward a possible challenge for the America's Cup. Inasmuch as all this involves the life or death or the emendation of the present rules of rating, the racing this year assumes a significance patent to every yachtsman. The small boat situation gives alluring promise. The co-operation of clubs in framing uniform rules, not only of measurement, but of sailing, have made for the best interests of the sport, and the one-design classes have served a similar end. The average amateur of limited means was quick to realize that he had no place in the regular classes with professional skippers sailing racers, the cost of which involved thousands of dollars for building and upkeep. Combinations were thus formed where, by virtue of restrictions, boats of one design were evolved in which details of construction and design being equal, failure or success depended largely upon handling. New classes of boats of this type have been formed for this season, new yachts are building for classes of former seasons, and, as in the past, this trend has served to place yachting upon a sane and substantial basis. For the sport, as a sport, present conditions cannot but be regarded as decidedly encouraging.

THE LAKE MICHIGAN MOTOR BOAT RACE.

NOT a little sectional interest has been aroused in the announcement that the winning boat of the Columbia Yacht Club's motor boat race to Mackinac Island, and the craft which finishes first in the New Rochelle-Marblehead event will compete in a race from Mackinac to Chicago. Bringing together as it will the best motor boats of the East and West in a body of water not altogether noted for its pacific nature, the contest may well be regarded as one of the most important ever held on the Great Lakes. The distance is over three hundred miles, and those who have traversed the course, which is largely out of sight of land, do not hesitate to say that abundant opportunity to test the skill of crews and the strength of engines will be found. In order to reach the starting point, the Eastern sailors must take their boat down the St. Lawrence River and through Lake Ontario and Lake Erie, a trip of several hundred miles, which, however, is not regarded as especially arduous, so far as sailing conditions are concerned. It is the intention to have the winner of the Mackinac race of 1908 go to Marblehead after that event and race to New Rochelle against the boat which wins the Eastern contest. Motor boat owners in this section of the country are pleased with the prospect of these races, and reports from the West suggest great enthusiasm and a rush of orders for new boats.

THE SEAWANHAKA CUP.

IT now appears that officers and members of the Royal St. Lawrence Yacht Club, which recently withdrew from further competition for the Seawanhaka Challenge Cup, have long regarded that trophy as a source of annoyance rather than inspiration. For ten years the Canadian club defended the "mug," at first with boats of conventional type, but later, as American yachtsmen became more keen in their efforts to regain the prize, with freak craft which were useless the day after the events were completed. Double hulls, double centerboards, double rudders, appeared ad nauseam until, under the fierce strain, the Royal St. Lawrence men had no time for the ordinary work of the club. And so when last year the trophy was taken back to the United States the Canadians decided to let it stay there, so far as their club at least was concerned. That the decision was not unwise, many of those prominent in American yachting circles will eloquently testify.

NO CRUISE FOR THE ATLANTIC YACHT CLUB.

WHETHER or not an abundance of racing will compensate the Atlantic Yacht Club for its decision to hold no club cruise this year is a matter of diverse opinion. More races in all classes, with consequent lack of time for a week's jaunt eastward, is the reason assigned by the club for the abandonment of its annual cruise, and no doubt the results will afford justification; but at the same time club cruises "are lots of fun."

FOR THE DEFENSE OF THE CANADA'S CUP.

THAT Canadian yachtsmen are leaving nothing undone in their preparations for the races for the recovery of the Canada's Cup, now held by the Rochester Yacht Club, is appreciated by those who are to defend the trophy, as evidence of which mark the invitation to yacht clubs of all cities on the American shores of the great lakes to build boats to compete in the trial races to select a defender for the prize. It is quite likely that this appeal would meet with hearty response were it not stipulated that the Rochester organization will retain the cup whether or not it be successfully defended by a Rochester club boat. Yachtsmen of other American clubs on our northern borders have not shown any great amount of enthusiasm in regard to this clause, and we dare say that no outside craft will, under the circumstances, be entered. The Rochester sailors are building but one defender, which places them at a disadvantage with the Canadians, for whom three English designed yachts are now under construction.

RADUGA

ELEANOR IV

Designed and Built by Williams-Whittelsey Co.

OWYHEE

Motor Boats as Deep Sea Cruisers

THERE is perhaps no form of yachting which has experienced such successful advancement as the larger type of motor boats for deep sea cruising.

Until recent years it was impossible to entertain a winter's cruise to Florida with any degree of comfort in a yacht less than 125 feet. This necessitated a very costly outlay, not only in the high price of the vessel itself, but the maintenance of a large and costly crew, which made it prohibitive to the yachtsman of average means. The larger type of power boat, from 50 to 100 feet, has solved the matter. Through the use of internal combustion machinery, a boat of 75 feet in length will afford comfortable cruising quarters for six or seven, aside from the crew. The size of the boat and the simplicity of the machinery makes her owner practically independent of his men, as anyone of ordinary ability can manage such a vessel if necessary.

Ex-Inspector Alex. S. Williams, of the New York police, has perhaps done more to prove the possibilities of the deep sea motor boat cruisers than any other yachtsman.

In 1905 he built the Eleanor III. from designs by H. N. Whittelsey, which was but 45 feet over all, and during that winter visited every hunting and fishing ground of importance from Virginia to Southern Florida. There was never a time when the Eleanor's owner doubted the ability of his ship, and she is ackowledged as one of the pioneers of her class.

Last fall Inspector Williams' ambition arose to higher planes, both in the manner of entertainment of friends and his curiosity as to the kind of fish that swam about the West Indies.

The Eleanor IV. was consequently built, and after visiting the popular hunting and fishing grounds of this coast is now cruising off Cuba. Like her predecessor (the Eleanor III.), she was designed by H. N. Whittelsey and built at the Long Island City plant of the Williams-Whittelsey Company. This company have foreseen the possibilities of the larger types of motor boats for express and cruising service, and have specialized to the extent of confining their designing and construction to this class only, and their achievements are certainly well known.

The Eleanor IV. is 65 feet over all, 14 feet beam and equipped with two 18-hp, 3-cylinder, 4-cycle gasolene motors. The machinery, crew's quarters and galley are located forward and separated from the owner's quarters by a water-tight bulkhead, with water-tight door connecting. The owner's quarters consist of a large double stateroom, bath and toilet adjoining; alcove stateroom, guests' toilet, large linen and storage closets and main cabin. The cabin contains Pullman berths, accommodating four persons. The hull is constructed of white oak, keel and framing. Planking is of prime, long-leaf yellow pine, and the whole construction is copper fastened and sheathed with 16-ounce copper.

The installation of the gasolene tanks is the same as is customary with this company, and is acknowledged by the marine fire underwriters as the best system known. No expense is spared in the matter, and with this system gasolene may be used with entire impunity.

The interior of the Eleanor is finished principally in cream enamel, with doors and trim of the finest solid African mahogany crotch. The furnishings consist of dainty Florentine silk window curtains, Wilton carpets and specially constructed cane furniture.

The Eleanor will sail for New York in the spring, and her log will certainly furnish some interesting information to yachtsmen.

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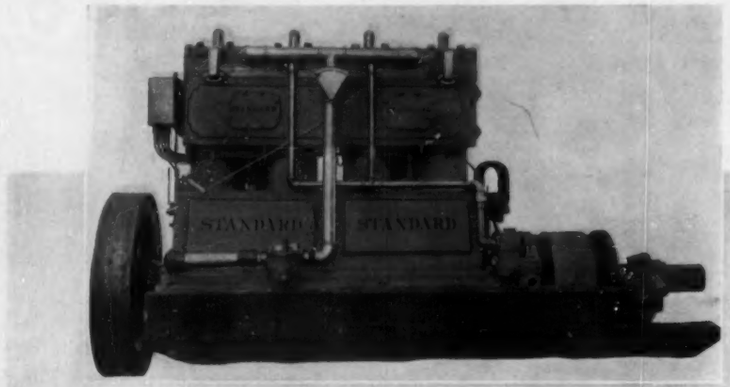

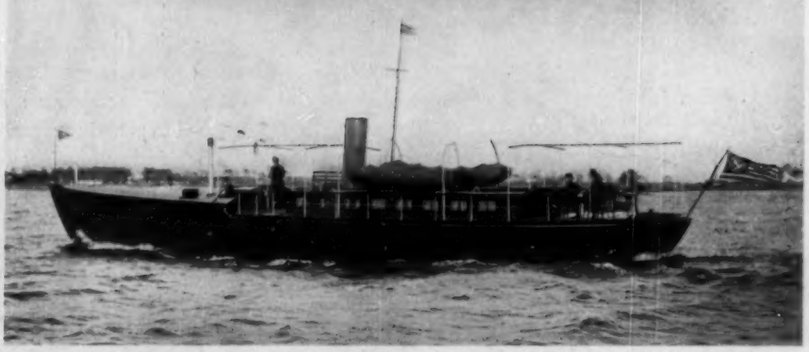

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WRITE FOR CATALOGUE

The Standard Motor Construction Co.

180 Whiton Street JERSEY CITY, N. J., U.S.A.

(Continued from page 209.)

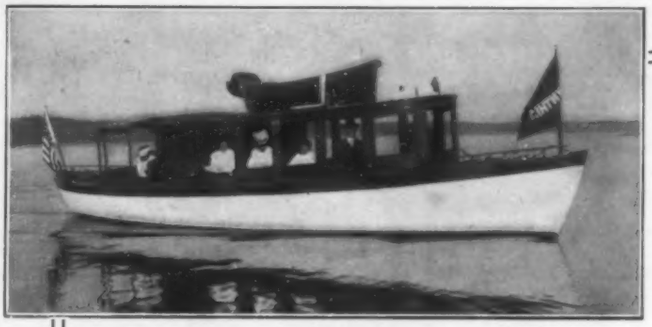
her the required distance. Vamoose seems at this time to have fallen into the bad habit of teasing the pride of the Hudson—Mary Powell—and one day, when that splendid old boat was making a 21-mile gait, danced all around her and beat her half a mile in fifty. A month later she made a mile in two and one-half minutes.

Meanwhile, Yankee Doodle was playing pranks with the crack Delaware River boats—making them look as if they were going the other way. At one time there was much talk of a race between Norwood and Vamoose and other boats, and the McBrides brought Yankee Doodle on to enter for the event; but she was disabled en route, and failed to qualify. Also Norwood, which now claimed a record of a mile in two minutes and one second, met with an accident.

Then came the Feiseen—Japanese for "Flying Arrow." She was a 78-footer, and seemed to have a *penchant* for making a pace-setter of the Monmouth. She steamed from Tebo's and overtook the Sandy Hook boat off Bedloe's Island. Now the Monmouth had a record of fifty-three minutes from Rector Street to the Highlands—20⅝ miles. No wonder she snorted at the presumption of the little one. But it is believed that the talk between her pilot house and engine room degenerated to "cussing" as the race progressed. The Feiseen ran under easy steam. When a mile ahead, she made a complete circuit and again drew up beside the passenger boat. There she remained long enough to be observed by the persons on board the other boat. When off lower Quarantine she made another spurt, reaching the pier, seven and a half miles away, eight minutes ahead of the passenger boat—an equivalent of 31.6 miles an hour. The craft that had held the record up to this time was the Russian torpedo-boat Adler.

The Feiseen, it seems, was doomed to mishaps. On one occasion she and Vamoose were returning from an International Cup event off the Hook. Feiseen was a mile in the lead when Vamoose sighted her and began to speed. The boat with the Japanese name was being rapidly overhauled when she blew out one of her boiler tubes and came to a stop. Her rival passed her a line and took her in tow. They were doing well enough, when the steamship Old Dominion came along, going to sea. Opposite the deep-water boat Feiseen suddenly sheered and ran plump into her. Three feet of the yacht's bow were knocked off, but her watertight compartment saved her.

Some time after this Mosher built Viper, a 40-footer, that did 38 miles. But his next great triumph was Ellide. No sooner was Ellide launched than she began to cut capers. She fell into the bad habit of teasing the grave and reverend "seniors" of the water world, and used to amuse herself making rings around river craft and laughing at them. But when her owner put her to the real business of going, told her to behave herself and show the gentleman what she could really do, she dug her toes into the water and spun a trail 40 miles in sixty minutes. At this, the world, having swung from the incredulous to the credulous, complained, rather than applauded. "He should have done bigger things," it said, meaning the builder, in a general sense. Even the press barely cackled at the new achievement. And why? Because the world had adjusted itself to high-speed ideas. While the Yankees were fighting among themselves for high-speed yacht supremacy, the foreigners were busying themselves with more practical craft—the torpedo-boat. Let it be understood that the record of the war boat was not a matter of a single mile, but of many; that speed without endurance meant nothing to her. Thorneycroft, the Englishman, had produced Ariete, 147-footer, that made 29.94 miles, and Schichau, the German, jealous of all things British, had put Nibbio, 150-footer, together and



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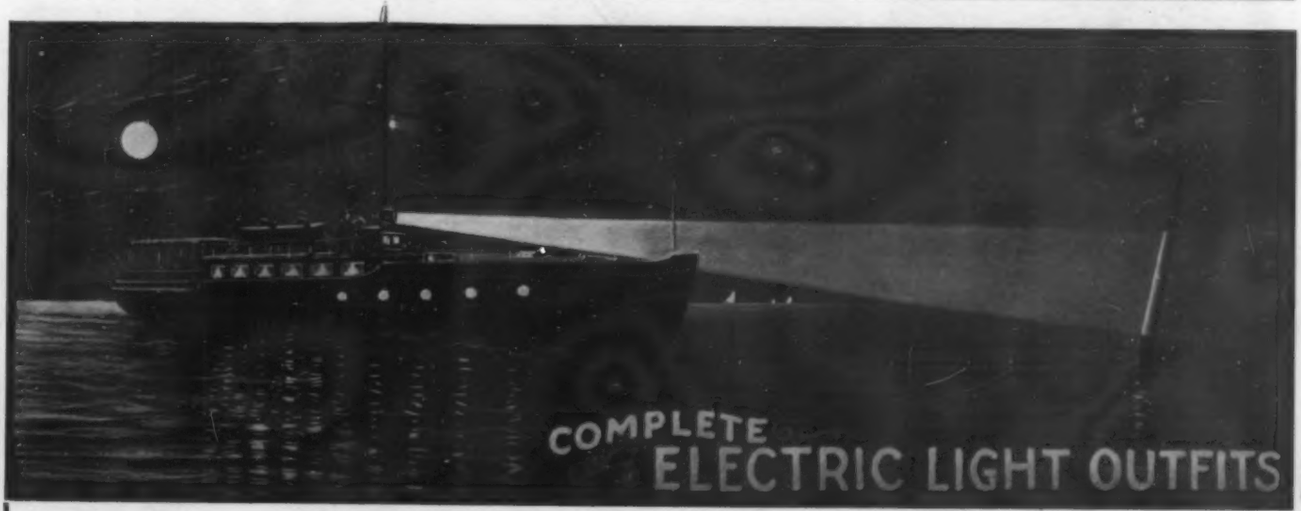

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pushed her 30.86 miles in the North Sea. Norman, the Frenchman, had now built a 144-footer that made 31.34 miles. Of course, he named her Chevalier. Meantime, Yarrow—everybody knows who he is—launched Hornet. She was 180 feet long and made 32.24 miles. Thorneycroft now put up Boxer and Daring, 205 and 185 footers, respectively, that made 33.59 and 33.70 miles. Yarrow retorted with Sokol, a 190-footer, that did 34.28 miles, and Thorneycroft came back at him with Desperate—208 feet long—that made 35.73 miles. While this sharp contest was going on between the Englishmen, Norman built the 144-footer Forban, which covered 36.88 miles in the Bay of Biscay. Everybody remembers how, about this time, Parsons, the Englishman, astonished the marine world with his Turbina—the first turbine craft—a little 100-footer that did 37.71 miles.

Of course, Ellide put all their noses out of joint. But she was only an eye-opener. In 1900 it was rumored that Mosher had designed for Mr. Charles R. Flint a boat that would make 50 miles. As a matter of fact, the craft referred to was to have a guaranteed speed of 33 knots, practically 38 miles. The prophecy that she was to be the fastest boat ever built, however, was to be fulfilled. In 1902, Mosher delivered the Arrow. On her trial trip she made 45.06 miles.

Yet the event excited little comment, relatively. The Birmingham "Daily News," of June 17, 1902, says: "The swiftest steamboat in the world is Arrow, just built." Another journal described her as so crowded with heavy and powerful machinery that it seemed as if the mighty engines would rend the frail form asunder.

And no wonder, when one considers that she was only 130 feet long, 12 feet 6 inches wide, that she drew but 3 feet 6 inches and displaced barely 66 tons, that she was driven by twin screws and quadruple expansion engines of 2000 hp each. What would the people think who scoffed at Fitch's "crazy notion" that a boat could hold machinery enough to move her if they could take a spin on Arrow?

Goodness knows where this high-speed mania will cease. There is little doubt that right now plans are hatching in the minds of naval architects to beat Arrow. Possibly her own designer will do it. However, her achievement dazzles us so that we lose sight of what is going on abroad. Remember, the foreigners are not idle. Think of the British Viper and Cobra, that made over 40 miles each. They were piled up on the rocks and knocked to pieces, but when their successors appear they will be, without doubt, better boats.

There's no real comfort on a high-speed boat when she's doing her best. The sensation is like that of riding on an old-fashioned gang-saw carriage. But the thrill of it makes one happy. One can really live on such boats as Tarantula and Niagara IV. when they are doing a 20-mile clip. In fact, it is a usual thing with them.

After touching on Arrow it seems an anti-climax to mention Drexel's Argo, practically a 31-mile boat. But she was less than half the length of the champion. She was built by the Seabury people, who also launched Mr. Brayton Ives' Vitesse, that made 29⅞ miles. These builders made the torpedo-boats Bailey and Wilkes and the destroyer Stewart—Bailey being the fastest boat in our navy. A notable success of theirs also is Mr. Henry H. Rogers' Kanawah, that won the Bennett Cup. She is a twin-screw steel boat, 227 feet long, and has a speed of 20 miles. She, like Tarantula and Niagara IV., is a splendid type of the fast cruising yacht.

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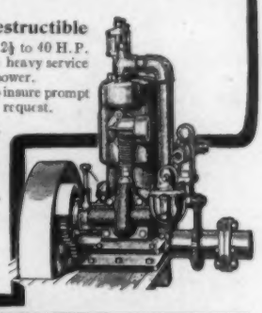

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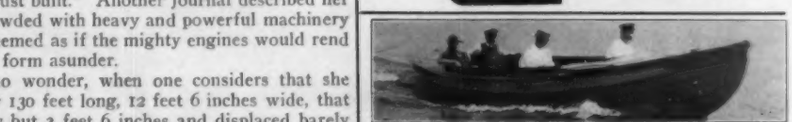

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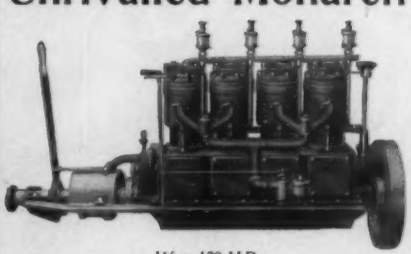

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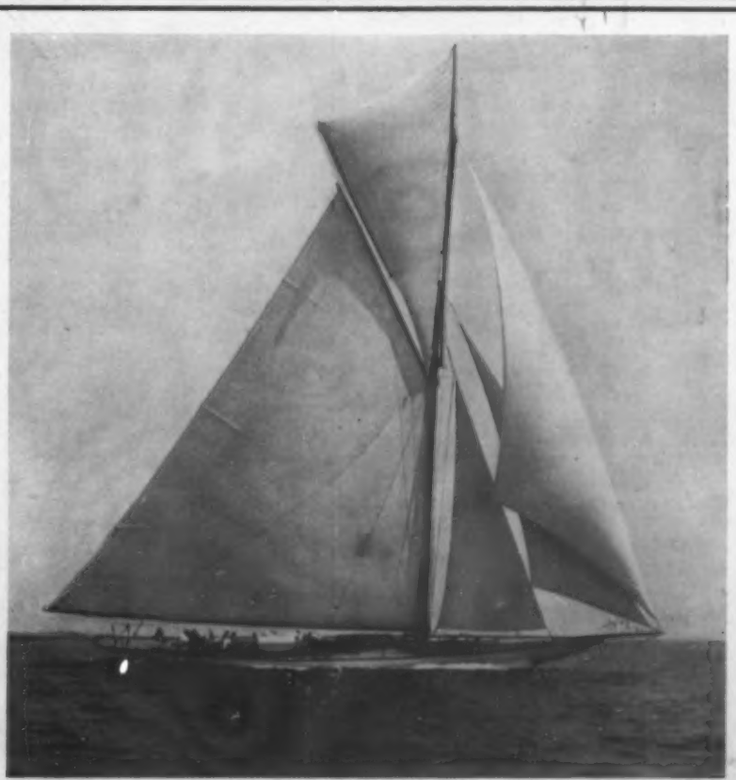

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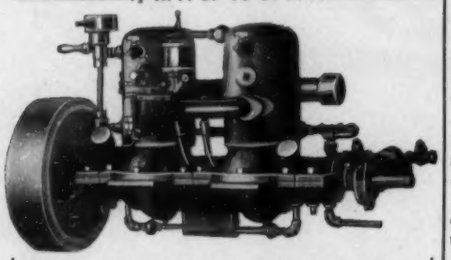

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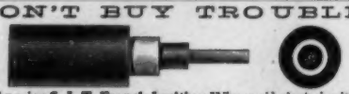

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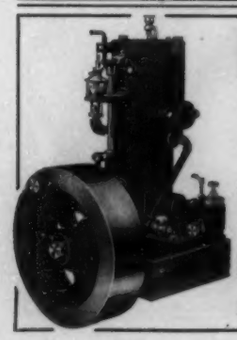

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(Continued from page 223.)

The wind was now slackening fast and shifting to the westward. The tide was coming in and we must work to save her if possible. The volunteer crew got a boat and anchor from one of the wrecks and managed to get it planted to windward, the sea going down enough to admit the small boat riding the surf safely. By 3 o'clock in the afternoon we managed to get the forestaysail upon her and shortly afterwards drove her off into deep water where she rode in safety. It was a close call. Five boats were lost within a hundred fathoms of her, yet she was safe again and as sound as ever, save for her stem where the cables had torn off the iron shoe in parting under the shock of the breakers.

She was not leaking, to speak of, and by night we went aboard again to dry out the half-flooded cabin and wet clothes. In her galley stove was the remains of that fine dinner, the egg-plant burned to a cinder, before the seas had poured down the smokepipe and put out the fire. Such was the hurricane of September 17, 1903, aboard the little Edna. She had weathered it safe enough, but had been thrown high upon the shore. The force of the squalls is apparent when one considers the fact that she was only 7 tons and had parted a chain of solid metal measuring ¾ of an inch diameter, dragged a 400-pound anchor and parted a 5-inch hawser, which, under ordinary circumstances, could lift her in the air. We did not know that the beach of the western end of the sound and lower bay was strewn with wrecks, but we knew we had had a close shave. That chain should have lifted at least three times the Edna's weight. It had stretched out in three places, showing that it had not parted in any one weak place, the breaking link simply being stretched out a little more than the rest. We looked for the steamboat E. S. Spring that evening, but she failed to make her appearance. She had gone to the port of missing ships, and not until two days afterward did we see pieces of her wreckage floating past Great Captain Island on the Connecticut shore. In the morning the papers had noble accounts of a gallant rescue by college boys, how I had been ashore at the time of the hurricane, and how the little ship had sunk everything in her path while coming in. We read them with amusement and showed them to Captain Von Heldon, who came aboard to see how we fared and take pot-luck with us. He read them through with a sour smile.

"I suppose," said he, "many of our great heroes get their glory upon just such accurate reports."

"Hardly," I answered, "for there was a "Herald" correspondent on the beach last evening, and that is something. There is seldom one at a great battle."

"Well, I'm not a hero," said he, "and it is on account of that I would like to have had my name mentioned. I did about all the heavy work—that college boy didn't look like he had enough to eat."

"Perhaps that's the reason he is mentioned so prominently," I said. "Every position has its compensations, you know."

"I reckon that's so," he assented, "we all have to get something. If you will give me a light for my pipe I will tell you the story of the David Kind blackbirding in the South Pacific."

CHAPTER VI.

During the days following the hurricane my finger was in a very bad state. It swelled as large as my wrist, and the pain was so intense that it had to be kept in hot creoline all the time, and for nearly a week I had no sleep. Elmer cleaned ship, and, with my wife, served the meals regularly. Sometimes we would run down the Sound, but as I could do little heavy work, these cruises were short. The publishing house

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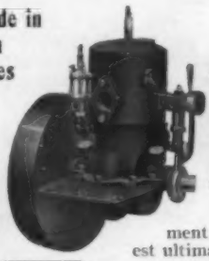

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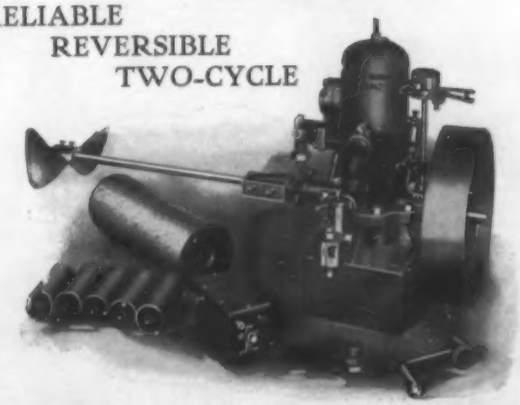

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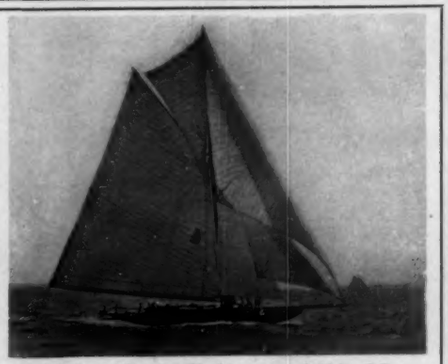

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bringing out a sea tale began to bombard me with proof-sheets, and I was kept so busy that little could be done to the Edna to fit her out for the Southern voyage. One day Elmer received a letter from home. He brought it to me with a joyous shout.

"My mother is very ill," he cried, "I must go to her."

I took the letter and read:

"Dear Elmer:—Your mother has not slept a single night, but lies awake and calls for you all the time. The doctor does not think she can live if you do not come home.

Your affectionate sister."

Elmer was so delighted I could but wonder.

"Do you think she is dangerously ill?" I asked.

"She must be dying," suggested Elmer, "she has always been very strong and must be awful sick to be like that—I think I better go, sir—I'll be back in a day or two."

His unfeigned joy was slight and puzzling. I pondered a little.

"Here," I said, "take your money and get your ticket for the early train. I shall expect you back by day after to-morrow."

I rowed him ashore and brought the boat back.

"That is the last of Elmer," I said to my wife.

"Do you really think so—he will surely come back," she said.

"Never, without the aid of the Sheriff," I answered.

The following day we received a letter, dated Bridgeport.

"Dear Captain:—Elmer is home again, and we are happy. His mother thanks you very much for your care of him. He has never been away from home before and will never go away from home again. Praise the Lord.

Yours, etc., his sister."

"It is not natural for any boy, no matter how bad, to be glad to hear that his mother is ill, probably dying," I said.

"No, I believe not," said my wife, "but Elmer was peculiar."

"Yes—no more greenhorns in this ship. The next man or boy that comes into her shall have an A. B.'s discharge—and from some ship I know." And so for a time we ran the little Edna alone and enjoyed it hugely.

In the morning we could rise and don bathing suits. Then over the side for a fine swim in the crisp air and sunshine of early day. Back again, we could lounge about or dress as we pleased, and with stores to choose from could have whatever we wished for breakfast—after I made the fire. Then to work or putting the mainsail on her, we would cast off the mooring and hoisting the jib, go sailing away over the sparkling Sound into the dim distance. It was an ideal life and we soon forgot the fierce hurricanes of the Gulf in the fine weather.

(To be continued.)

Through a typographical error, the correct formula for the uniform rule in Mr. Gardner's article, in February YACHTING, was misprinted. It should have appeared as follows:

$$\text{Rating} = \frac{L \times \sqrt{s}}{5.5 \sqrt[3]{D}}$$

It could have been written:

$$\text{Rating } R = .0182 \frac{L \times \sqrt{S}}{\sqrt[3]{D}}$$

We also wish to correct the record of the victories of the 60-foot Weetamoe, which appeared in last month's issue. Out of eighteen races, the sloop won twelve events, was five times second and once third. One of her wins was the Astor Cup, for sloops, one of the New York Yacht Club's classic trophies.

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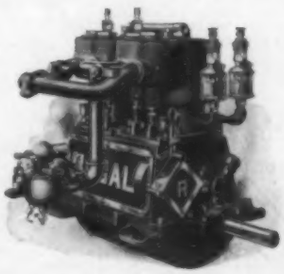

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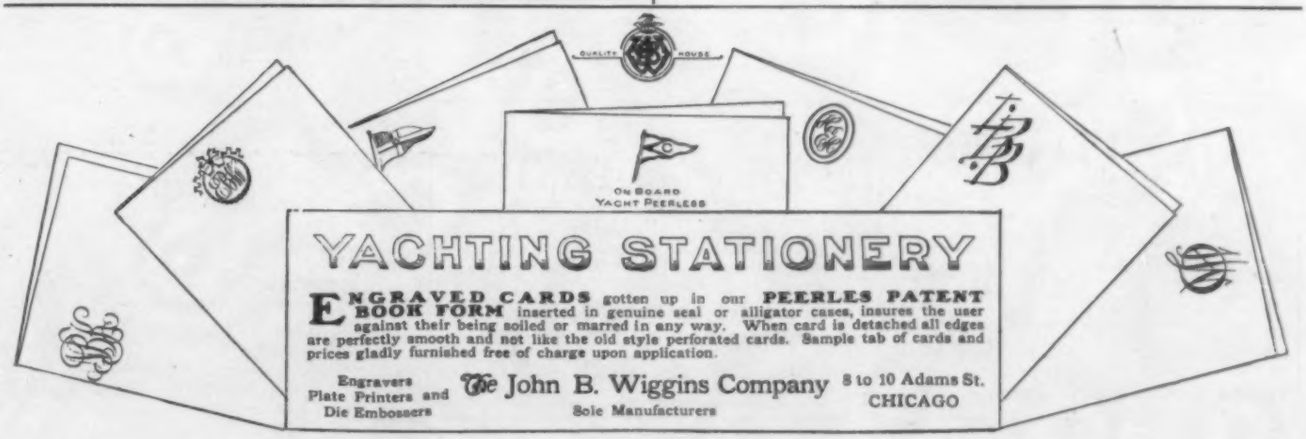

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(Continued from page 217.)

apropos of the fact that so many Germans prefer the English steamers, which occurred on board of one of the finest English ships bound out of New York. An elderly gentleman from Boston sat down at dinner with his daughter the first night out. With the intention of ordering wine, he reached for what he supposed to be the wine list, carefully adjusted his eye-glasses, consulted his daughter and then, calling the waiter, he said, "Bring me a small bottle of this Laubenheimer (pointing at the card) and my daughter will try a pint of Guggenheimer." The waiter replied, "Beg pardon, sir, but that's the passenger list you are lookin' at."

In describing the routine rules in vogue on the majority of Atlantic liners, but unfortunately not always rigidly enforced, I have endeavored to impress upon the reader the great security and safety afforded passengers in ocean travel. Where this discipline is relaxed, disaster will surely follow. A notable and well-known instance of this is the loss of the Paris, in which case Captain Watkins, having taken his departure from Cherbourg and sighting the light on the Caskets 16 miles further to the westward, in calculating the distance to be run to the Lizard light on the southwest coast of England, made a mistake in simple addition and ordered the officer of the deck to run a distance of 20 miles too great, which resulted in hanging his ship upon the dangerous reef known as the Manacles, where the Mohican met the same fate, but with more disastrous results at about the same time. In the case of Captain Watkins, he added 90 and 16 and made it 126 instead of 106, gave the officer of the deck the course and distance to be run and left the bridge. The weather being somewhat thick, the ship overran her course, with the result stated. In this case, if the captain had made his cabin-boy "check up" his calculations, the disaster would have been averted.

Another instance of laxity in observing the rules concerning "checking up," to which I have before alluded, was in the case of the Mohican, involving the sacrifice of several hundred lives. For the particulars of this accident I am indebted to Mr. John Hyslop, the well known and greatly beloved veteran yachtsman, who, for so many years, acted as official measurer for the New York, Seawanhaka, Larchmont and other prominent yacht clubs. I was in England at the time of the official inquiry following the accident and returned on the same steamer with Mr. Hyslop, who had been on the Mohican when she was wrecked, and who, because of his intimate knowledge of navigation and nautical affairs, had been requested to remain in England and testify before the official board of inquiry. Returning together on board the Umbria we discussed the details of the disaster with Captain Dutton in the Umbria's chart room and with the aid of his chart. Coming along the South coast of England, bound Westward, the Captain of the Mohican made the light on Prawl point and then laid the course for Eddystone light, which he passed close on the starboard hand, and which, of course, gave him accurately the position of the ship. He laid the course from that position (in order to clear the Lizard on the starboard and pass out to sea) at about West by South, or, as is termed at sea, South, 81° North. The ship struck the reef at about 6:30 p. m. The quartermaster, who had left the "dog-watch" at 6 o'clock, was drowned, but the quarter-master who had relieved him testified that the course given to him by the retiring quarter-master was West by North. By examining the chart we found that from Eddystone, the course West by South would clear the Lizard and take the ship safely to sea; whereas the course West by North would take a ship direct to the Manacles, where

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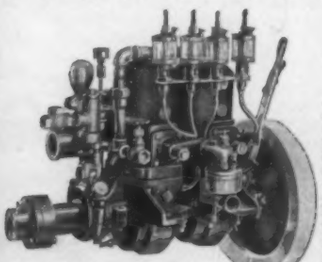

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It is made in three separable water-tight compartments, which stack one within the other in such small space that it can be carried in the cock-pit of a catboat. The three sections can be so securely fastened together that the whole makes a very strong seaworthy wooden boat. It can be put together or taken apart in one-half minute.

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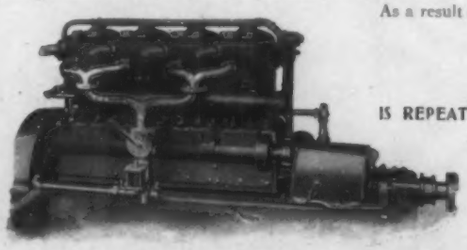
Perhaps you know that the U. S. Government selected the Jager engine for use in the navy, the Revenue Cutter Service and the Department of Commerce and Labor for special service in the Arctic, the Temperate and Torrid Zones.

But here is the most important point to you: Very careful records of the performance of the Jager Engine have been kept in each of these departments for the guidance of various other departments in the purchase of gasoline engines

As a result of this painstaking care, the



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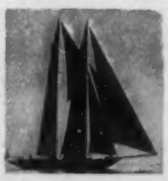

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Models for every use. Prices, packed, $28 up.

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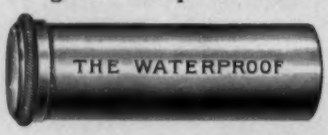

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We make the best 2 and 4 cycle engines that skilled workmanship can produce.

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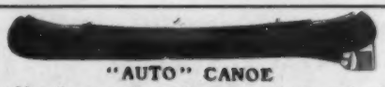
EAST BOOTHBAY, MAINE.

the Mohican was lost. This was a case of misunderstanding of oral orders and was due to the absence of the printed card, which should have been posted before the quarter-master. Even with this omission it was the duty of the officer of the deck to see that when the quarter-masters were changed at 6 o'clock the new man had the correct course. But the officer of the deck was also drowned and his testimony was therefore unavailable. It is easily understood that if the rules which I have described had been adhered to, this terrible disaster would have been averted.

The importance of the observance of these rules is particularly emphasized by a personal experience of my own on a steamer bound from Trieste, Austria, for Alexandra, Egypt, via Brindisi, Italy. Not a word of English was spoken on board. Italian being the principal language used. Fortunately, I was able to speak that language and had no difficulty in making the acquaintance of the second mate, an Italian, who acted as sole navigating officer. The old skipper was rarely seen on the bridge, and neither he nor any other officer ever took an obervation on the entire trip.

The second officer cordially welcomed me on the bridge and in the chart room; and with my own instruments and charts I took all the observations and worked out all the calculations, reporting to and comparing results with him. Leaving Brindisi we skirted the Grecian coast on the port hand, whence we took our departure for Alexandria on a course approximately S. E. On a Sunday morning I took a sight for longitude, independently worked it out and reported my results in writing. The officer compared my figures with his and advised me that I had placed the ship 6 minutes of longitude (or arc) too far to the westward and suggested that possibly I had made some error in my calculations. I checked all my figures, but could not find any error. Feeling that it would be discourteous for an amateur to question his accuracy, I said no more about it. After dinner he invited me to come up on the bridge, as he expected to make Alexandria light at about midnight. Accordingly I went up there and found no one but the officer and quarter-master (the skipper having turned in at about 10 o'clock). We walked up and down and chatted for an hour, meanwhile looking directly ahead for Alexandria light. When midnight came and no light was visible he became very restless, pacing up and down the bridge and swearing vigorously in Italian. At about 1 o'clock he happened to walk over to the port wing of the bridge and from there accidently discovered Alexandria light ½ a point abaft the beam on the port hand. He excitedly yelled to the quarter-master, "hard to starboard," and hauled the ship's head around to the N. E. He held that course until we had Alexandria light on the proper bearing, and, then, after giving the quarter-master orders to head for the light, he began to do some quick figuring with a stub of a lead pencil on his shirt cuff, finally announcing to me that the ship was 4 miles too far to the Westward. This error of 4 miles at that latitude exactly tallied with my difference of 6 minutes of longitude. When we made the light it was starlight overhead, but hazy near the surface of the sea, so that we could not see any land and no one will ever know how narrow our escape was; but my belief is that we were very close in to the breakers. It goes without saying, that if this Sunday morning observation had been checked by someone in authority, instead of by a "land lubber," the error in his compass course would have been discovered and corrected.

In April, 1901, I had occasion to cross the River Nile, a short distance south of Cairo, and engaged an old Arab skipper to take me on a typical "felucca." The boat was about 60 feet long and rigged in the usual felucca



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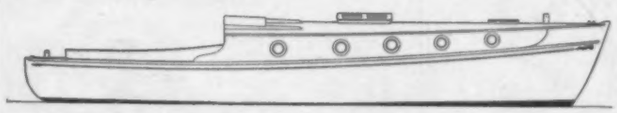

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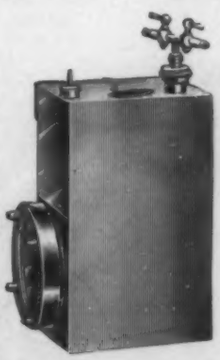

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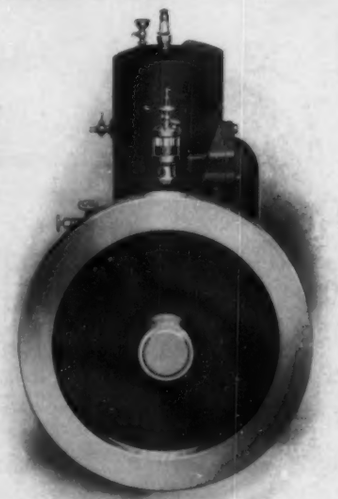

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fashion. As I had sailed almost every other rig known, I had some curiosity to feel the helm of this boat. I therefore entered into negotiations with the skipper through my dragoman. An animated conversation in Arabic ensued, accompanied by the usual shrugging of shoulders and gesticulations with arms and hands. My dragoman informed me that it would be possible to secure permission for me to take the helm, but it would be very expensive. Asking how much it would cost me, I was informed that the matter could be amicably arranged for ten piastres, or fifty cents of our money. I paid the fee in advance, whereupon the old skipper threw up his hands and got down on his knees and kissed my feet. I then took the helm, which was about 20 feet long and attached to a rudder about the shape and size of an ordinary barn door and soon satisfied my curiosity.

At Cairo I engaged passage on the S. S. Persia, which was at that time the flagship of the "Peninsular and Oriental," known all over the world as the "P. and O." line. I, fortunately, had a letter of introduction to the captain from one of the Cunard officers, which I presented immediately after boarding the ship at Port Said, near the northern entrance of the Suez Canal. As senior captain, he was commodore of the line, and I found him to be a highly educated gentleman with a most attractive personality, and I shall always remember with gratitude his hospitality and courteous treatment during the entire voyage to London via Marseilles, Gibraltar and Plymouth. Having my own sextant, etc., I had no difficulty in getting access to the ship's chronometers, the captain having instructed the navigating officer to afford me every possible facility for my work. After sending up to the bridge the results of my first two or three observations or "chronometer sights," the captain, greatly surprised and apparently agreeably disappointed at their accuracy, immediately adopted me as an extra navigator and gave me orders from day to day which involved all of the work of the navigating officers. It was an invaluable experience, differing from that of the regular transatlantic route, in that our courses were constantly changing and our chronometer sights were taken both East and West of Greenwich.

After passing through the Straits of Messina, between Scylla and Charybdis, with Mt. Etna looming up on our port hand, we passed through the narrow straits of Bonifacio, between the islands of Corsica and Sardinia, called at Marseilles and then laid our course for Gibraltar. One night, off the Spanish coast, the commodore came to me and in jocular fashion informed me that he wanted to have his chronometer rated and asked me if I knew how to do it. Replying in the affirmative, I was ordered to be on the bridge with my sextant the following morning at 7 o'clock, when he expected to be off Cape Gama. Accordingly, the next morning I took an observation of the sun and worked out the longitude by the time as shown by the chronometer. By comparing this position on the chart with the actual position of the ship with Cape Gama abeam, I followed the usual method of converting this difference in arc into difference of time and so ascertained the exact chronometer error. The regular navigating officer having been ordered to make the same calculation independently, we both reported to the captain and he was greatly delighted to find that we agreed within six-tenths of one second of time.

Leaving Gibraltar and skirting the coasts of Spain and Portugal we took our departure one night at about midnight from the light on Cape Finisterre, at the southern entrance to the Bay of Biscay, shaping our course about N. N. W. for the light on Ushant, which marks the northern

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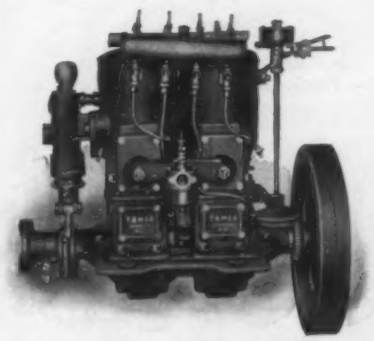

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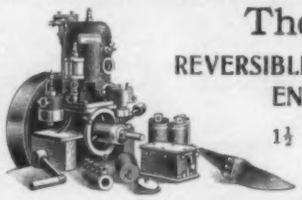

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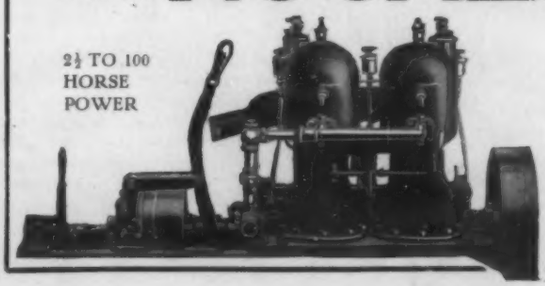

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Friction drive, no batteries to start.

THE original speed controlled dynamo, its governors control its speed and uniform current at variable speeds of the engine. ¶ Is thoroughly insulated, not affected by dampness, dust, or change in temperature. ¶ Will operate both the make and break and the jump spark systems. ¶ It is a battery charger and will charge all storage batteries for ignition purposes. ¶ For economy, reliability and uniform current, do away with your batteries and use a Motsinger Auto-Sparker for starting and running your gas engine.

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entrance to the bay, a distance of about 350 miles. The next morning I got a good sight of the sun, went to my room, worked out the problem, and, as usual, sent my report in writing to the bridge. I heard nothing from it until night, when the commodore told me that the longitude given him by the navigating officer had placed the ship 5 or 6 miles further to the Eastward than I had. He had compared my detailed figures with those of the navigating officer and found that mine were correct. The navigating officer admitted his error, much to the delight of the junior officers, who "jollied" him, as the commodore expressed it, for being "beaten by a land lubber."

Concerning the question of safety, few realize or understand how infinitesimally small is the chance of serious accident on a modern twin-screw ship properly equipped and manned. The fact that with two screws and two sets of engines one serves as an auxiliary in case of accident to the other, does not, by any means, constitute the only factor of safety. The hold is divided by iron bulkheads into numerous compartments.

If any of these compartments is flooded the ship will still float. There was, for illustration, the Arizona, which ran "head on" into a huge iceberg, running 14 knots an hour 1,000 miles from port. A big hole was stove in the bows, the forward compartment was completely filled with water, but the bulkhead held secure and the ship made her way to port.

But in a single-screw ship the one vulnerable place is the engine space, which is necessarily so large that, if filled with water, the ship will sink. For example, the loss (by collision) of the Elbe in the North Sea, the Burgoyne in mid-ocean, and the Oregon off the Long Island coast. In each of these cases the ship was struck amidships, the engine space filled with water and the vessel went down.

In a twin-screw ship, however, there is a midship longitudinal bulkhead. This so-called "fore and aft" bulkhead divides the engine space into two sections, neither one of which is of sufficient capacity to sink the ship when filled. Hence it will be seen that there is no possible danger of sinking a twin-screw ship in any collision. Moreover, these ships all have double bottoms and sides, with an intervening space, so that there are practically two hulls, one built within the other.

The old fears of trans-atlantic travel have greatly diminished, and as a matter of fact, ought entirely to disappear. With me, the old adage "Familiarity breeds contempt" has failed to apply in this case. My familiarity with the wonderful system, the rigid discipline and modern construction of the Atlantic liner of to-day has imbued me with admiration and respect; and if this simple narrative should aid others in attaining the same degree of confidence my effort in writing it will have been well repaid.

Power Boat and Engine Information

Under this head we propose to answer inquiries of general interest, without publishing names or addresses of correspondents.. All our readers are free to avail themselves of this privilege, and our columns are open for discussion, so long as personalities are not indulged in, and the subject matter is pertinent and in the interest of the power boat or yacht owner.

I am having a gasoline engine installed in my boat. The manufacturer insists on using lead pipe for the gasoline supply, while I maintain that copper tubing is better. Will you please decide and give your reasons?

Ans.—The manufacturer whose specifications call for lead gasoline supply pipe does so either because he can buy it for less money, or does

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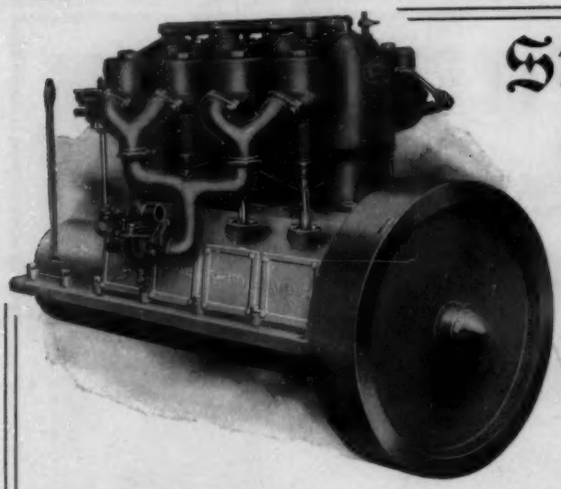

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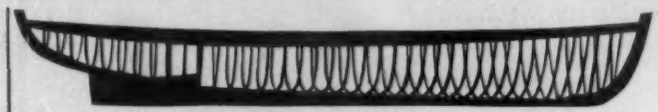

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not know that seamless soft copper pipe, ¼ or ⅜ inch iron pipe size, threaded and all connections soldered, would be much safer and less liable to fracture or crystallization from vibration. In France no power boat could be insured if lead gasoline supply pipes were used in the installation. One manufacturer of marine gasoline engines, to his sorrow and expense, a short time ago used lead exhaust piping in several installations of large engines. He has returned to the use of ordinary black iron steam pipe, and foresworn the use of lead pipe hereafter for that purpose.

I have a yawl and desire to equip her with power. Am cramped for room where I desire to locate the engine, and I am undecided as to whether to buy a small high-speed engine which would take up little room, or a medium-speed engine which would occupy considerable of my cabin. Which would you advise?

Ans.—The low or medium-speed engine will cost you more, take up more room and weigh more than the engine which has to be run at an abnormally high speed to develop its rated horsepower. A high-speed engine is naturally shorter lived, costs more for repairs, and if the boat is heavily built, is not so well suited to the requirements as the more rational slow or moderate-speed engine. No one would ever consider the installation of a light high-speed yacht engine in a heavy towboat, or a heavy towboat engine in a yacht, for obvious reasons.

Is it a fact that the two-stroke engine uses very much more gasoline per horse-power per hour than a four-stroke?

Ans.—This question is hard to answer in the absence of any authentic information as to the fuel consumption in engines of both types. Manufacturers usually devote very little time to making horse-power and fuel consumption tests, their results often appalling them when they do make them. The four-stroke engine manufacturer uses as his strongest argument decreased consumption, while his brother two-stroke manufacturer, being unable to refute the accusation, for most likely he does not know himself what the actual consumption is or should be, looks for another argument to promote the sale of his engines, usually being satisfied to claim absence of valves, or cheapness. There is no doubt but that some two-stroke engines consume more gasoline than some four-stroke. It is also a fact that some four-stroke engines consume more than some two-stroke. There is no denying that very many two-stroke engines are not designed for fuel economy. This is proven by the fact that some engines will show marked economy over other makes of same bore and stroke and running at the same speed, the one which shows greater economy of fuel often developing the more power.

Copper having advanced in price so that copper gasoline tanks are prohibitory in many cases, how can galvanized iron tanks be built to make them safe?

Ans.—Galvanized sheet iron or steel made up into tanks, no matter whether soldered or riveted, is not safe and should be prohibited by law. If iron tanks are to be used, they should be of good thickness, preferably electric welded, and tinned or galvanized after they are made up, and never under any circumstances should they come into contact with oak, the acid in it having a decidedly corrosive effect on galvanized, tinned or raw sheet iron.

Are weights ever used on inlet valve stems of four-stroke engines instead of springs?

Ans.—One manufacturer has used such weights, but replacing them with suitable springs in one case resulted in an increased engine speed of some 15 per cent and considerably reduced fuel consumption.

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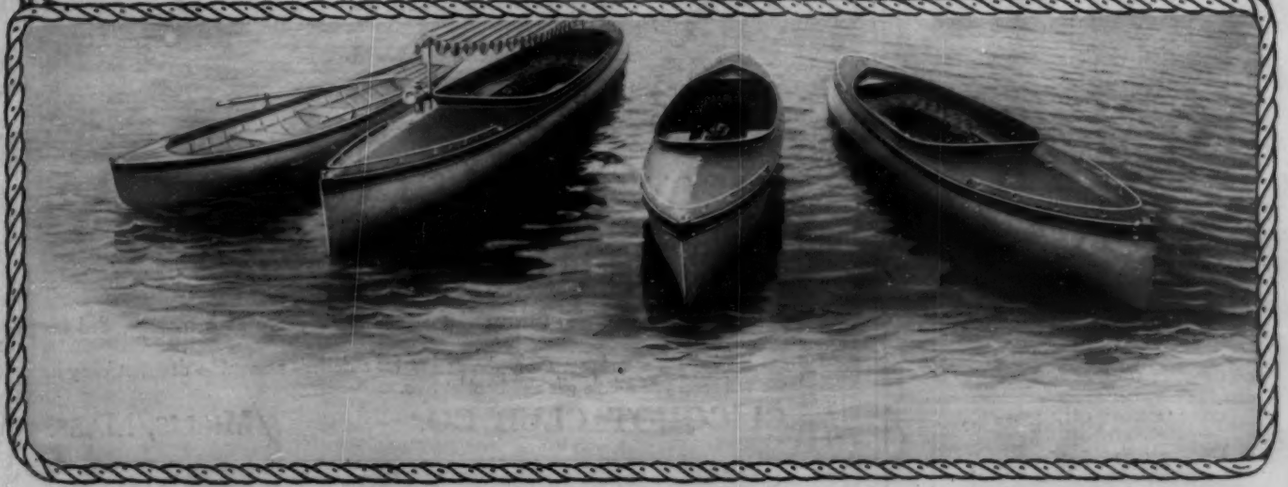
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